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ARE WE THERE YET?

The Path toward Sustainable Private Sector Development in the Caribbean

Editors: Diether W. Beuermann, Sylvia Dohnert, Henry Mooney, Ricardo Sierra

This book shatters the research dearth on the Caribbean private sector. It delves into contemporary issues that influence productivity and development through policy-oriented data-driven approaches using the recently conducted IFPG survey. Unveiling the impact of COVID-19, vulnerability to climate change and disasters, weak investment climate, complex policy environment, skills mismatch and education, technology and innovation, and financing obstacles, it offers a roadmap to unleash the region's full economic dynamism. A must-read for policymakers and anyone seeking to ignite the Caribbean private sector's full potential.

—Preeya S. Mohan
Senior Fellow, Sir Arthur Lewis Institute of Social and Economic Studies,
The University of the West Indies at St. Augustine

Evoking their warm temperatures, sunny beaches, and natural beauty, we think of Caribbean countries as paradise. However, when we realize that many of them suffer from low growth and high volatility, brought about by negative shocks and policy mismanagement, we may be inclined to think of *paradise lost*. How can Caribbean countries find the way back to their economic and social potential? The answers are rigorously, orderly, and intelligently presented in this volume. In a nutshell, the advice is straightforward: governments must provide an enabling environment for workers and businesses and let a "vibrant private sector in the Caribbean" flourish.

—Norman V. Loayza
Director of the Global Indicators Group, The World Bank

This book highlights that the private sector is the linchpin of sustainable and inclusive economic development. Overlaying the existing robust empirical evidence with survey-based rich data with a high level of granularity, the in-depth analyses relate challenges facing Caribbean firms and offer feasible solutions that complement the existing resources within their ecosystem. To this end, this timely and highly relevant volume is a reservoir of knowledge on the Caribbean business environment, and interested readers will appreciate its easy-to-digest content as a salient source of reference for Caribbean firms, policymakers, and academia.

—Nadine McCloud
Senior Lecturer, Department of Economics,
The University of the West Indies at Mona

This book provides timely and insightful economic and policy analyses of productivity in the Caribbean. The authors are world-leading scholars on the topic. They examine the investment climate in the Caribbean, innovation, employment and productivity, and the impact of COVID-19. Based on the insightful data and analyses, the volume further provides a recommended policy agenda for the Caribbean. I strongly encourage anyone with an interest in the Caribbean and economic and policy frameworks to read this book.

—Douglas Cumming
DeSantis Distinguished Professor of Finance and Entrepreneurship,
Florida Atlantic University

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Foreword

Increasing the productivity of firms is the main factor to accelerate long-run growth. Prior to 2020, several Caribbean nations were implementing reforms to improve local conditions for firms to prosper. However, the COVID-19 pandemic reversed much of this progress, bringing the vital tourism industry to a near standstill and exacerbating existing economic challenges. In this context, as Caribbean economies recover, it becomes imperative to implement pending policies to foster economic growth through the private sector.

Many of these essential policies pertain to key areas such as the investment climate in which firms operate, the quality of human capital available in local labor markets, the innovation capacity of firms, and the availability and adequacy of firm financing. Accordingly, this volume presents a fresh analysis of these issues for 13 Caribbean nations: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. The in-depth assessments presented throughout the book convey a comprehensive understanding of the private sector's evolving role in the Caribbean economy.

In essence, addressing the reforms necessary to cultivate a more dynamic private sector in the Caribbean is both urgent and indispensable. Enabling favorable business environments is critical to place the region on a sustainable growth path. Consequently, this volume highlights key issues that require attention. Some of these elements are more urgent than others, and certain countries have already made progress in implementing some of them. Policymakers and various stakeholders in each country face the task of identifying the best way to move forward and prioritizing the policy agenda.

By focusing on these critical sectors and leveraging the most recent data, this book offers actionable insights and recommendations for policymakers

and business leaders. We hope that the analysis presented here becomes an evidence-based, practical tool to motivate and inform relevant policies across the Caribbean. The goal is to strengthen collaboration between the public and private sectors, ensuring a sustainable economic recovery, fostering a resilient labor market, and, ultimately, improving the quality of life for people across the Caribbean.

Anton Edmunds
Manager, Caribbean Country Department
Inter-American Development Bank

Acknowledgments

The Caribbean Country Department (CCB) and the Institutions for Development Sector (IFD) of the Inter-American Development Bank (IDB), together with IDB Invest, partnered to perform this fresh analysis of the key enabling factors needed to foster economic growth through the private sector in the Caribbean. The study covers 13 Caribbean nations: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. This book follows up on a CCB volume published in 2016—*Engine of Growth? The Caribbean Private Sector Needs More Than an Oil Change,* by Inder J. Ruprah and Ricardo Sierra—that explored these issues exploiting firm-level data from the 2010 World Bank Enterprise Surveys and the 2014 Productivity, Technology, and Innovation Survey. The current volume presents fresh evidence from a new round of firm-level representative data, the Innovation, Firm Performance, and Gender Survey, which surveyed formal businesses in 2020.

This effort would not have been possible without the commitment of the Compete Caribbean Partnership Facility to collect robust and periodic representative firm-level data across the Caribbean. The authors deeply thank Nadine McCloud, Preeya Mohan, and David Rosenblatt for their valuable comments and recommendations. David Einhorn provided high-quality copyediting services. Juan Ramon Castellon efficiently coordinated production of the volume. Heather Bernard designed a highly relevant dissemination campaign. Marianne Michalakis designed the book cover. Sandra Reinecke and her team at The Word Express provided excellent typesetting and art design services. Valeria Vargas provided excellent research assistance.

The views expressed in this volume are those of the editors and authors of the corresponding chapters and do not necessarily reflect the views of the Inter-American Development Bank or its Board of Executive Directors.

About the Editors and Contributors

About the Editors

Dr. Diether W. Beuermann is a Principal Economist in the Caribbean Country Department of the Inter-American Development Bank. He has led research and data collection projects in various countries, including The Bahamas, Barbados, Colombia, Democratic Republic of Congo, Guyana, Jamaica, Peru, Russia, Suriname, Trinidad and Tobago, and the United States. His research has covered the effects of different information and communication technologies on agricultural profitability, child labor, academic performance, pre-natal care, and neo-natal health. He has also conducted research on the effectiveness of participatory budgeting, the short- and long-run effects of educational quality, the multidimensional nature of school causal effects, the determinants of school choice, the effectiveness of math-focused parenting programs, the role of remittances as a social insurance mechanism, the effects of early-life weather shocks on short- and long-term human capital accumulation, the effects of public health insurance on health outcomes and labor supply, the effects of behavioral-based entrepreneurship training on firm profitability, the effects of blue-collar crime on financial access and credit prices of affected firms, and whether and how conditional cash transfers may influence the effectiveness of other human capital development policies. He has published in several leading international peer-reviewed journals including the *Review of Economic Studies, American Economic Journal: Applied Economics, Journal of Human Resources, Journal of Health Economics, Journal of Development Economics,* and *World Development*. He holds a B.A. in Business Management and a B.Sc. in Economics from the Universidad de Lima, an M.Sc. in Finance from the University of Durham, and an M.A. and Ph.D. in Economics from the University of Maryland-College Park.

Dr. Sylvia Dohnert is a Private Sector Lead Specialist in the Competitiveness, Technology, and Innovation Division of the Inter-American Development Bank and is the Executive Director of Compete Caribbean. The Compete Caribbean Partnership Facility (CCPF) is a US$32.5 million multi-donor initiative that promotes increased productivity by firms and their contribution to economic growth by supporting business climate reforms, cluster and value chain initiatives, and innovation and technology adoption by the private sector. Compete Caribbean supports more than 50 projects in 13 beneficiary countries and has created more than 12,000 jobs in the region and substantially increased revenues and exports of beneficiary firms. Dr. Dohnert has also contributed to the design of public sector programs to stimulate private sector development in Latin America and the Caribbean. She has conducted extensive research on industrial policies in Brazil, Venezuela, and the Caribbean, and is an editor of the monograph "Exploring Firm-level Productivity and Innovation in Developing Countries: The Perspective of Caribbean Small States." Dr. Dohnert holds a Ph.D. in Economic Development and Regional Planning from the Massachusetts Institute of Technology.

Dr. Henry Mooney serves as Principal Economist with the Inter-American Development Bank. He previously worked with investment bank Morgan Stanley in London, The International Monetary Fund (IMF), World Bank, as well as Canada's central bank and government, including in dozens of countries in Africa, Asia, Europe, Central Asia, Latin America and the Caribbean. His responsibilities have included leading regional economic research and publications, serving as mission chief and team leader or team member for IDB, IMF and World Bank financial operations and technical assistance (e.g., sovereign debt issuance and restructuring, public financial management, and institutional reform), as well as formulating economic forecasts and reform conditionality for IMF adjustment programs and surveillance. Dr. Mooney is a widely published author, with dozens of papers, reports, journal articles, and book chapters, whose work has been featured in *The Economist Magazine*, *New York Times*, *Wall Street Journal*, *Reuters*, and dozens of other media outlets. He is a contributing member of the Atlantic Council's Financial Inclusion Working Group and Climate Response Task Force and has served on non-profit boards in several countries. Henry is a dual Brazilian and Canadian citizen, who completed his university studies in economics and finance at Concordia University (B.A.), The London School of Economics (M.Sc.), The University of London (M.Phil./Ph.D.), and Harvard University (M.P.A.).

Mr. Ricardo Sierra is a development economist with more than 15 years of experience with international financial institutions in development economics, data science, empirical economic research, and monitoring and evaluation techniques. He has provided consulting services for the Inter-American Development Bank (IDB), the World Bank, Barbados' Statistical Service, Guyana's Ministry of Social Protection, and IDB Invest, among others. His wide-ranging experience also includes strategic planning, project design, field coordination/supervision, portfolio monitoring, program evaluation, and project completion reports. He has published multiple working papers, policy briefs, technical notes, and flagship reports on the Latin America and Caribbean region. He holds a Master's degree in Economics from Boston University.

About the Contributors

Dr. Maria Cecilia Acevedo is a Lead Strategy Officer in the Strategy and Development Effectiveness Department at IDB Invest in Washington, DC. She leads the preparation of country strategies for IDB Invest, in particular by providing technical analysis through the inclusion of the private sector perspective for Latin America and the Caribbean. Dr. Acevedo conducts research on economic development issues, especially the contribution of the private sector to the well-being of the population and the mechanisms through which market solutions are efficient to achieve this objective. A Colombian national, Dr. Acevedo holds an M.A. and Ph.D. from Harvard University and an M.A. in Economics from the Universidad de los Andes in Bogotá.

Mr. Khamal Clayton is an Economist in the Caribbean Country Department of the Inter-American Development Bank. Khamal is part of the Caribbean Economics Team, providing support for the creation of research and policy products. He previously worked as a Research Analyst at the International Monetary Fund and the World Bank and was a Business Analyst at BlackRock, Inc. He has a Bachelor's degree in Economics-Mathematics with a concentration in Latin American and Caribbean Studies from Columbia University and a Master's degree in International Economics and International Relations with a focus on International Development from the Johns Hopkins University – School of Advanced International Studies.

Dr. Nathália Pufal has extensive expertise in leading innovation projects and conducting data collection and analysis in various countries. She has worked in the Competitiveness, Technology, and Innovation Division of the Inter-American Development Bank and held leadership roles in innovation and sustainable development projects at municipal and state levels in Brazil. She has been a researcher at the NITEC Innovation Research Center and has served as a professor of innovation in Brazil and a visiting scholar at the Institute for International Science and Technology Policy at George Washington University. Dr. Pufal has contributed to more than 30 publications with an international impact. She also serves as a reviewer for international journals such as *Research Policy, Science and Public Policy,* and the *Journal of Manufacturing Technology Management.* She has a Ph.D. in Innovation, Technology, and Sustainability.

Dr. Patricia Yañez-Pagans is a Principal Economist in the Development Effectiveness Division of IDB Invest, where she directs the ex-post evaluation work of operations in the IDB Invest portfolio and the knowledge agenda related to impact measurement. Dr. Yañez-Pagans joined the Inter-American Development Bank (IDB) Group under the Young Professionals Program and initially served as an Economist in the IDB's Office of Strategic Planning and Development Effectiveness. Previously she worked as a consultant on impact evaluation topics for different institutions, including the World Bank, UNICEF, the Ministry of Development Planning of Bolivia, and the IDB Research Department. She was also Professor of Economics at the Universidad Católica Bolivia. Dr. Yañez-Pagans has a Ph.D. in Applied Economics from the University of Wisconsin-Madison, a Master's in Applied Economics from Pompeu Fabra University, and a Master's in Social Policy and Development from the London School of Economics and Political Science.

1

Introduction: The Need for a Vibrant Private Sector in the Caribbean

Diether W. Beuermann

The private sector is an indispensable force for sustainable development—it sparks the innovation, improves the productivity and economic efficiency, and creates the jobs and growth needed to boost shared prosperity.

International Finance Corporation (2015)

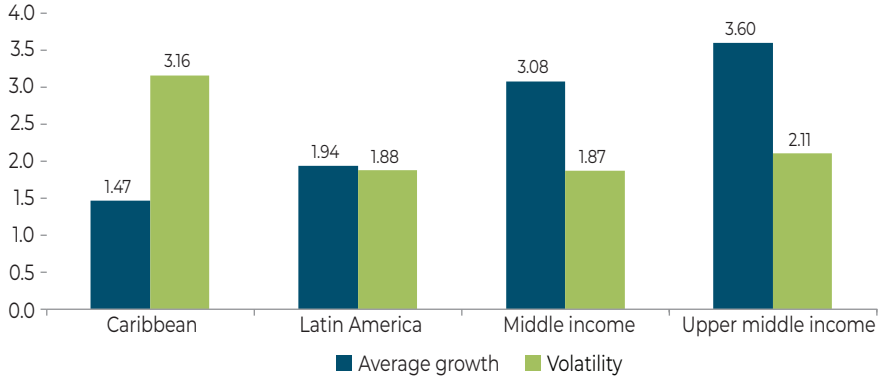
The Caribbean is a unique region, home to a plethora of languages, traditions, and other elements of heritage that can be traced to the diversity of its people and the richness of its history. This diversity is ubiquitous across the 13 Caribbean nations covered in this book: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago.[1] Although income levels differ across Caribbean countries, common features include their relatively low economic growth and high volatility over the long term. Figure 1.1 shows that during the 1960–2019 period, the Caribbean grew at a yearly average of 1.47 percent. This figure is below Latin America's annual growth rate of 1.94 percent and significantly below the pace of expansion of both middle-income and upper-middle-income countries in the rest of the world, which grew at 3.08 and 3.6 percent, respectively.[2]

Moreover, besides being the slowest growing region, the Caribbean also has had a more erratic growth trajectory. Figure 1.1 reveals that the volatility of the Caribbean's long-run growth was 3.16 percent over the period examined. This figure is significantly higher than the growth variability of the other country groups of approximately 2 percent. This low and erratic growth path

[1] References in this chapter to the Caribbean refer to these 13 countries.

[2] For the analysis of long-term growth, the COVID-19 pandemic period was intentionally excluded. However, this issue is discussed in detail in Chapter 2 of this volume.

Figure 1.1. Long-Term Growth and Volatility, 1960–2019 (Percent)

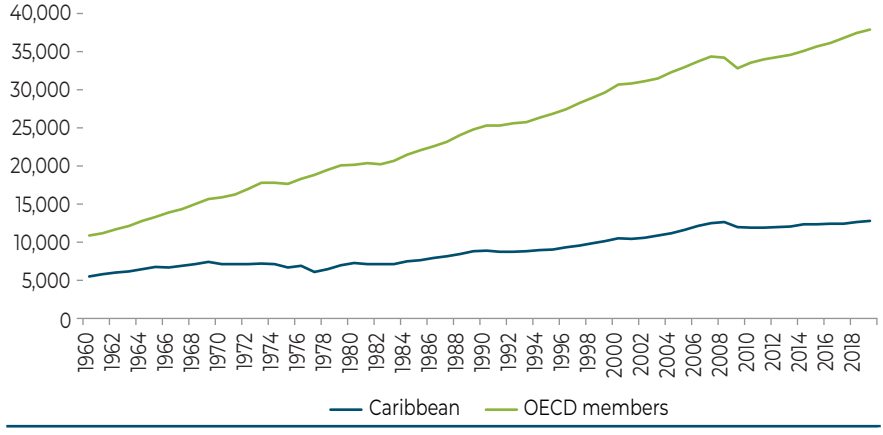


Source: Prepared by the authors based on data from the World Bank, World Development Indicators.
Note: The figure displays the average growth rate of real GDP per capita (in constant 2015 U.S. dollars) between 1960 and 2019. It also displays the standard deviation of the yearly growth of GDP per capita during the same period (i.e., volatility).

is behind the relative stagnation of Caribbean living standards compared to more advanced economies. Indeed, while in 1960 the real GDP per capita of advanced countries in the Organisation for Economic Co-operation and Development (OECD) was roughly double that of the Caribbean, by 2019 it was triple that of the region (Figure 1.2).

Furthermore, structural fiscal shortcomings, coupled with relatively weak fiscal discipline, have resulted in a sizable accumulation of debt in the Caribbean since the late 1990s and early 2000s. This was then exacerbated

Figure 1.2. GDP per Capita in the Caribbean versus OECD Member Countries, 1960–2019 (Constant 2015 U.S. Dollars)



Source: Prepared by the authors based on data from the World Bank, World Development Indicators.
Note: OECD: Organisation for Economic Co-operation and Development.

by the 2008 global financial crisis, and more recently by the COVID-19 pandemic (Beuermann and Schwartz 2018; Schwartz and Beuermann 2021). Thus, Caribbean economies can be characterized by low growth, high debt-to-GDP ratios, and relative stagnation of living standards.

What are the determinants of the Caribbean's relatively weak performance? This key question has been explored by previous literature. While the small size of Caribbean countries both in terms of land mass and population has been cited as a potential determinant, evidence shows that this is not the case. Ruprah, Melgarejo, and Sierra (2014) report that size per se of Caribbean nations does not account for the documented underperformance. The authors instead provide evidence that growth is held back by the high vulnerability to increasing natural disasters and the relatively low productivity of the private sector.

Indeed, while a minor contributor to climate change, the Caribbean is one of the most vulnerable regions worldwide to the consequences of it. The region is highly exposed to tropical storms and hurricanes, phenomena that will continue to increase in frequency and intensity due to climate change. This not only causes immediate destruction of infrastructure, but also newly documented long-term effects on the labor productivity of persons affected by these adverse shocks during critical stages of life. For example, Beuermann and Pecha (2020) document that tropical storms and hurricanes that strike when a woman is pregnant have negative short-term effects on early childhood development and potential detrimental long-term effects on the child's eventual adult productivity. Focusing on high school academic performance, Spencer, Polachek, and Strobl (2016) find significantly negative effects of hurricanes on standardized science examinations.[3] Pecha (2017) shows that hurricanes increase adult informal employment in Jamaica by 14.5 percent, reducing productivity, limiting tax collection, and reducing contributions to the social security system.

Regarding the private sector, there is little doubt that it plays a critical role for development by creating jobs, providing goods and services, and stimulating economic growth. It is the most important source of tax revenue for governments to fund public services and investments in resilient infrastructure. It is also a key driver of innovation that often leads to new products, services, and technologies with the potential to mitigate climate change and improve people's lives. Given the importance of a vibrant private sector, it is critical to promote policies and initiatives that facilitate

[3] These are the Caribbean Secondary Education Certificate examinations administered in the last year of secondary school by the Caribbean Examinations Council (CXC). See the CXC website (www.cxc.org) for more detail.

an enabling environment for businesses to thrive. As highlighted by Loayza (2023), governments and the private sector need each other to succeed. Without an enabling business environment created by governments, the private sector is like a rusty engine that grumbles and barely moves.

As such, the documented challenges in the Caribbean are consistent with a private sector that is far from reaching its full potential. Ruprah and Sierra (2016) showed that the Caribbean private sector underperformed comparable countries across several dimensions, including investment, sales growth, innovative capacity, and productivity. In-depth analyses concluded that the main constraint to growth is a policy environment that fails to promote a dynamic and innovative private sector. The authors identified several areas where policies need improvement, including policies related to customs and trade, access to finance, crime, and the lack of an adequately skilled workforce.

Given this recognized unfavorable position of the Caribbean private sector, this book provides fresh evidence on the opportunities and challenges of this key ingredient of the economies in the region. The book primarily relies on the most recent round of enterprise surveys sponsored by the Compete Caribbean Partnership Facility.[4] The Innovation, Firm Performance and Gender Issues in Enterprises in the Caribbean (IFPG) Survey collected firm-level information on a representative sample of formal businesses across the 13 Caribbean nations that are the subject of this study between March and November of 2020. The survey was the third round of Caribbean regional enterprise surveys, following those conducted in 2010 (World Bank Enterprise Surveys) and 2014 (Productivity, Technology, and Innovation Survey).[5] This book exploits this unique and methodically assembled data to explore the status of the critical enabling factors for private sector development in the Caribbean.

While the data were being collected for this volume, the world experienced the shockwaves of the COVID-19 crisis. Every region in the world felt the drastic impact of the pandemic both in terms of human loss and economic activity, but the Caribbean was hit particularly hard (Arteaga-Garavito,

[4] Launched in 2012, the Compete Caribbean Partnership Facility (CCPF) is a private sector development program that delivers innovative and practical solutions to stimulate economic growth, increase productivity, and foster innovation and competitiveness in the 13 Caribbean countries examined in this book. The CCPF is a partnership between the Inter-American Development Bank, the Foreign, Commonwealth & Development Office, the Caribbean Development Bank, and the Government of Canada.

[5] The complete microdata and documentation of Compete Caribbean's surveys are available at https://www.competecaribbean.org/proteqin-ifpg-datasets.

Beuermann, and Giles-Alvarez 2020). Based on key firm-level information collected in the midst of the pandemic, Chapter 2 documents the effects of the crisis on various aspects of firm performance, including firms' management decisions on human resources, financing, investments, production, and operations. The chapter also examines innovation efforts in the wake of the pandemic and their effectiveness.

Chapter 3 focuses on the investment climate in which Caribbean firms operate. It starts by documenting that investment levels and capital accumulation do not fall short in the Caribbean. Rather, the relatively low productivity of the average Caribbean firm is found to be an issue. The analysis measures indicators related to the investment climate by exploiting data on firms' applications to obtain services such as electricity, water, telephone, and the Internet. Information is combined on the amount of time it took to obtain such services and whether the firm made informal gifts or payments to get things done. The analysis shows that firms that operate in relatively friendly investment ecosystems are significantly more productive than firms operating in environments less prone to facilitating investments.

Chapter 4 focuses on what Ruprah and Sierra (2016) documented as one of the most important barriers for doing business in the Caribbean: the lack of an appropriately educated workforce. It shows that this picture remains largely unchanged, as the labor supply in the Caribbean falls short with respect to the skills demanded by the private sector. The analysis shows that one determinant of this situation is skill-biased emigration, as about 70 percent of the Caribbean population with tertiary education emigrates. Moreover, although the diaspora sends remittances back to the Caribbean, those remittances do not compensate for the public resources invested in education and the lost productivity due to emigration. Overall, the chapter emphasizes the dire need for policies to bridge the gap between the skills demanded by the private sector and the curricula offered by local technical and vocational training institutions. This could tackle the skill mismatch in the labor market by providing students with skills that are in high demand.

Innovation has been associated with productivity growth at the firm level because innovative firms tend to use their resources more effectively and adapt or develop new technology that usually increases output per worker (Kim and Loayza 2019). Chapter 5 provides information on technology use by Caribbean firms such as access to digital payments, digital innovation, and the use of new media. Firms are then classified as innovative, potentially innovative, or non-innovative to assess the main characteristics associated with firm innovation. The chapter also analyzes the main barriers to innovation and the impact of innovating in terms of accessibility

to new markets, sales growth, quality improvements, and cost reductions. In addition, the chapter provides evidence on transformation readiness and advanced digital technology use among Caribbean firms.

Access to finance has been widely identified as one of the biggest obstacles to private sector development in the Caribbean (Ruprah and Sierra 2016; Schwartz and Beuermann 2021). Empirical evidence has shown that inadequate access to finance impairs firm productivity and growth (Beck, Levine, and Loayza 2000; Ferrando and Ruggieri 2018; Levine, Loayza, and Beck 2000; Motta 2020). Chapter 6 provides an overview of both the key macroeconomic issues affecting the development of financial markets across the Caribbean as well as structural factors that have influenced the adequacy and availability of credit to firms and households. This includes a particular focus on smaller enterprises and women-owned and women-led firms that appear most challenged in terms of access to credit. Related findings point to important hurdles, as well as policy reforms and other actions with the potential to drive faster and more inclusive financial development across the region.

The volume ends with concluding remarks and some suggestions for policy reform presented in Chapter 7. As evidenced throughout this book, the accumulated evidence on the relevance of an appropriate ecosystem for private sector development unequivocally shows that it plays a catalytic role in boosting shared prosperity. Nonetheless, the ability of a country to enable a business environment that facilitates private sector growth ultimately depends on the country's specific situation and characteristics. It is our hope that the fresh empirical evidence presented in this book will provide substantive material for countries in the Caribbean to embark on a policy reform agenda that favors private sector development, as it is critical to improve living conditions in the region.

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2

One Step Forward, Three Steps Back: Caribbean Firms amid the COVID-19 Pandemic

Diether W. Beuermann and Ricardo Sierra

The impact of the COVID-19 pandemic on various health, social, and economic outcomes was certain to be pronounced and enduring even as early as October 2020, when the crisis was in full swing and no effective treatment had yet been publicly released. Governments in the Caribbean reacted promptly to contain the spread of COVID-19 and protect their citizens. However, the region had difficulties preventing the spread of the disease because of health infrastructure shortcomings and largely fragmented social protection systems.[1]

This chapter provides an overview of the pandemic in Latin America and the Caribbean by focusing on key health parameters that have been widely used to assess its effects. It offers useful insights about the short-term impact of the health crisis on different outcomes by summarizing the findings of rigorous studies conducted in the region. After reviewing COVID-19-related data at the country level (benchmarking the Caribbean with the rest of the Latin America region), the chapter provides a firm-level analysis of the COVID-19 crisis in the Caribbean exploiting data from the Innovation, Firm Performance, and Gender (IFPG) Survey.[2]

2.1. Previous Evidence on the Impact of COVID-19

Many studies on the early impact of COVID-19 were conducted during the first six months after it was declared a pandemic by the World Health

[1] According to the Organisation for Economic Co-operation and Development's Latin American Economic Outlook 2020, nearly 40 percent of all workers in the region did not have access to any form of social assistance or social protection services (OECD 2020). In addition, approximately 8.5 million jobs were projected to be lost due to closures of micro and small firms in the region.

[2] See Compete Caribbean, https://www.competecaribbean.org/proteqin-ifpg-datasets/.

Organization (WHO) on March 11, 2020. Apedo-Amah et al. (2020) analyzed a dataset of over 100,000 businesses from 51 countries and generated several stylized facts about the short-term impacts of the pandemic:

- The shock was severe and widespread across firms, with persistent negative effects on firms' sales.
- The impact on labor occurred primarily through reductions in working hours and the use of leave. Layoffs were still minimal by October 2020.
- Smaller firms faced disproportionately harsher financial constraints.
- Firms relied on digital solutions to handle the shock.
- There was uncertainty about the prospects of firms whose sales had dramatically diminished.

These stylized facts derived from early research on the effects of COVID-19 on firm performance are quite telling in themselves and have implications in areas that will be covered in this book, such as human capital and labor conditions (Chapter 4), the broader use of innovation and digital technologies (Chapter 5), and the financial constraints exacerbated by the pandemic (Chapter 6).

Overall, Apedo-Amah et al. (2020) showed that the likelihood of a business being open at the peak of the crisis (and four weeks after) decreased by 30 percent. Tourism-related activities were disproportionally affected because of the travel restrictions adopted worldwide. The likelihood of a tourism-related business being open six weeks after the peak of the outbreak decreased by 73 percent in the food and beverage services industry, and by 54 percent in the accommodation sector. In terms of employment, Apedo-Amah et al. (2020) concluded that firms in the accommodation sector had the highest probability of granting leave to employees (52 percent) and cutting their wages (32 percent). Furthermore, the authors showed significant differences with respect to firm size. Larger firms were more likely to be open (89 percent) compared to micro (79 percent) and small firms (82 percent). While no Caribbean country was included in this study, the heterogeneous results in terms of firm size and industry sector point to greater vulnerability for Caribbean firms, which tend to be small, with a larger share operating in tourism-related industries.

Guerrero-Amezaga et al. (2022) studied the effects of the pandemic on small businesses in Latin America and the Caribbean between March and November 2020.[3] They used data from daily surveys of small business owners

[3] The study covered Argentina, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Mexico, and Peru.

that collected information on the characteristics of firms and owners, including formality status, layoffs, closures, revenues lost, and expectations about the future of their firms. They found that the pandemic had large negative effects on employment and on expectations about the future. The firms surveyed were less aware of existing relief programs and, therefore, received less assistance.

Bottan, Hoffmann, and Vera-Cossio (2020) studied data from an online household survey conducted in 17 Latin American and Caribbean countries and found large effects: 45 percent of respondents reported that a household member lost a job, and 59 percent of those who owned a business reported that they had to close it.[4] These negative effects were larger among households within the lowest income quintile prior to the pandemic, which illustrates how the pandemic exacerbated existing inequalities in developing countries.

Arteaga-Garavito, Beuermann, and Giles-Alvarez (2020) used the same online socioeconomic survey to analyze the effects of the COVID-19 pandemic on six Caribbean countries,[5] summarizing their findings on four key issues: (i) household incomes fell and the number of vulnerable households increased rapidly during the first six weeks of the pandemic, (ii) vulnerable households could not cover basic needs,[6] (iii) the Caribbean recorded an unprecedented rate of job losses, and (iv) social assistance programs were proven to be an important mechanism to support Caribbean populations during the crisis.

The evidence of the impact of the COVID-19 pandemic has of course not been limited to a single region. An analysis on small businesses in the United States using the April 2020 Current Population Survey (Fairlie 2020) showed a dramatic 22 percent decrease in the number of active business owners during a short period of time (February to April 2020). Moreover, women business owners were disproportionately affected by the pandemic. They experienced a 25 percent decrease in business activity compared to a 20 percent drop for men-owned businesses during April 2020. Fairlie (2020) also provides evidence of disproportionate negative effects on minority- and immigrant-owned businesses in the United States. These findings suggest a potential broader impact on long-term racial inequality because of the importance of small businesses in job creation for minorities.

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4 The study covered the The Bahamas, Barbados, Bolivia, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guyana, Jamaica, Mexico, Panama, Peru, Suriname, Trinidad and Tobago, and Uruguay.

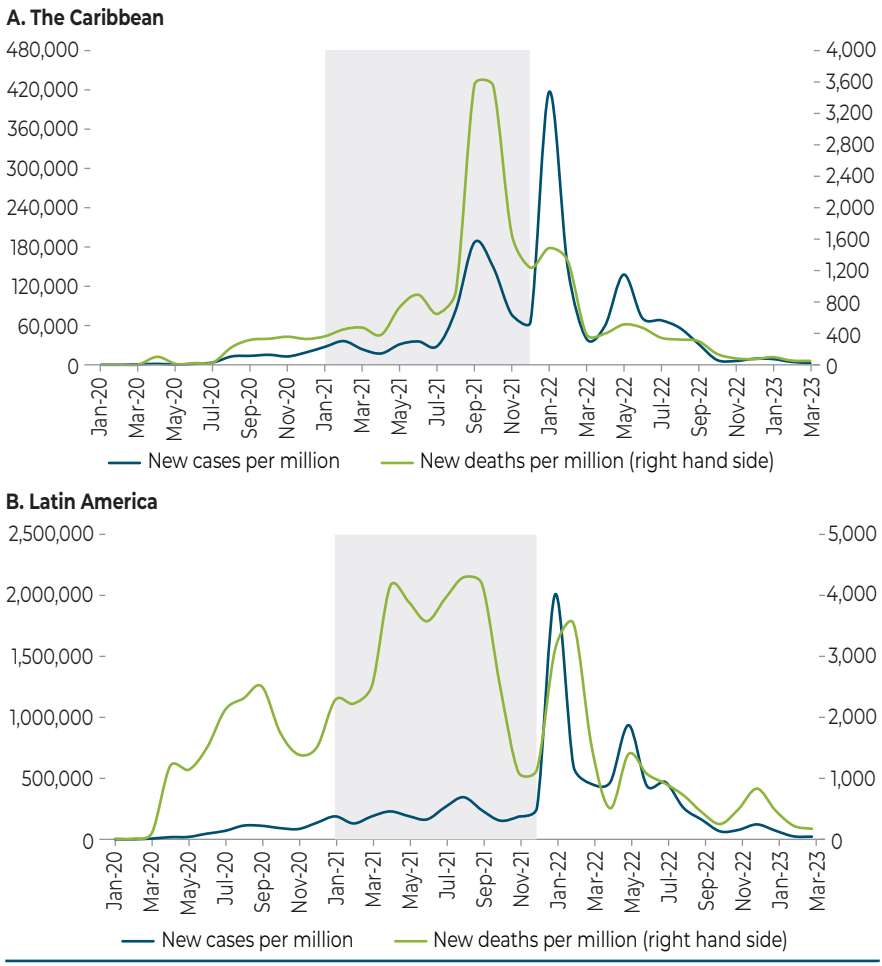
5 The Bahamas, Barbados, Guyana, Jamaica, Suriname, and Trinidad and Tobago.

6 Indeed, 34.4 percent of households earning below the minimum wage reported experiencing hunger and 51.9 percent reported deleterious changes in their diet.

2.2. COVID-19 at the Country Level

Within this context, it was expected that Caribbean firms would have to endure difficult conditions after March 2020. Given the new strains of the virus that were detected as the pandemic progressed, the negative effects of COVID-19 persisted over time. Figure 2.1 provides a clear illustration of the

Figure 2.1. New Cases and Deaths from COVID-19 in Latin America and the Caribbean, January 2020 to March 2023



Source: Prepared by the authors based on data from Our World in Data (n.d.).
Note: The Caribbean (panel A) includes Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. Latin America (panel B) includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela.

evolution of the pandemic in terms of two main indicators: the official number of new cases and registered deaths.

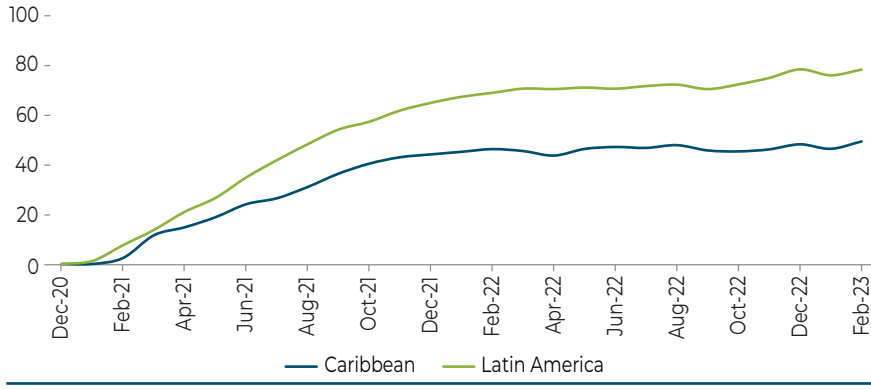
The pandemic affected health, social, and economic standards in the Caribbean in a manner similar to Latin America. However, the incidence of COVID-19 followed a somewhat different pattern. As shown in panel B of Figure 2.1, Latin America was one of the world's most heavily affected regions during the early onset of the crisis (2020), while in the Caribbean the number of cases and death rates remained lower (panel A). The measures adopted early by Caribbean governments included tighter border controls, which had negative effects on tourism but seemed to control the spread of the virus during 2020. However, conditions deteriorated quickly in the Caribbean in 2021, when infection and mortality rates surged dramatically. According to the Economic Commission for Latin America and the Caribbean (ECLAC 2022), during the later months of 2021 COVID-19 caused between four and seven deaths per day (per million inhabitants) in the Caribbean. This number is similar to the rates observed in North America during the same time period.

In November 2021, WHO designated the COVID-19 Omicron variant, first identified by scientists in South Africa, as a "variant of concern" because of its potential for increased transmissibility and decreased vaccine protection. This variant was the main driver behind the spike in cases seen during the early months of 2022 in the Caribbean. The same pattern occurred in the rest of Latin America and mortality rates were flatter in the Caribbean during this time. The lower mortality rates observed since mid-2022 have been commonly attributed to immunity (natural or acquired via vaccination) levels around the globe.

Since the first COVID-19 vaccine was administered to a nurse in the United States in December 2020, vaccine rollout has been unequal in different countries. It was slower in the Caribbean than in the rest of Latin America, reaching 20 (per 100 population) only in June 2021. The gap has widened since, with the average vaccination rate in the Caribbean at about half of the rates in the rest of the Latin America in March 2023. Countries from the Caribbean and Latin America have faced difficulties acquiring sufficient vaccines to cover their national demand.[7] Figure 2.2 shows the evolution of the number of people who received at least one vaccine dose (per 100 population) in Latin America and the Caribbean. In January 2022,

[7] While financing and supply issues explain some of the disparities in access to vaccines, hesitancy has also played a role in the Caribbean. Between August and October 2021, tens of thousands of doses expired before they could be used (United Nations 2021).

Figure 2.2. COVID-19 Vaccination Rates in Latin America and the Caribbean, December 2020 to February 2023 (per 100 population)



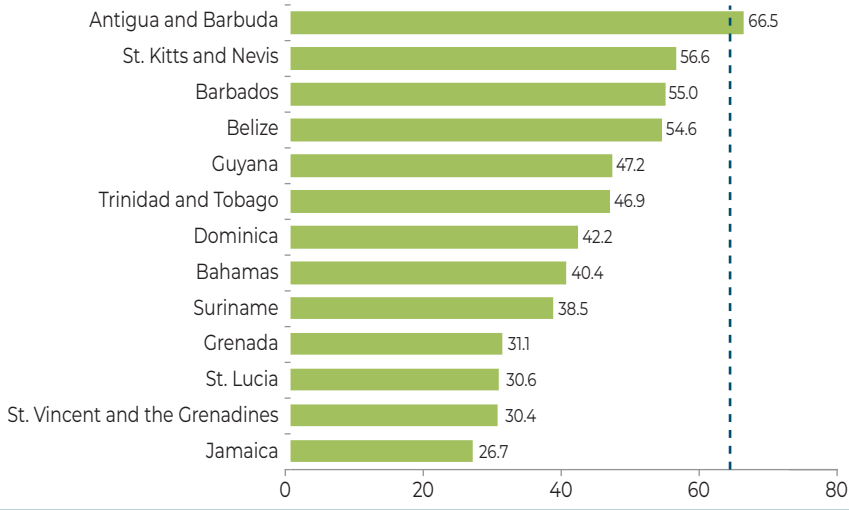
Source: Prepared by the authors based on data from Our World in Data (n.d.).
Note: The Caribbean includes Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. Latin America includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela.

the difference in this metric was substantial. The Caribbean had an average of 45.3 people vaccinated (per 100 population), while this figure stood at 67.5 persons for the rest of Latin America. By February 2023, there was a slight improvement in the Caribbean, but still it reached only 49.5 persons (per 100 population), while the average for the rest of Latin America increased to 78.4 persons.

The country differences not shown in Figure 2.2 are important to note. Analyzing the endpoint (March 2023) data, it can be seen that the vaccination rate in Antigua and Barbuda (68.5) is more than double that in Jamaica (30.2). Partial vaccination (just one dose), which is what is shown in Figure 2.2, is part of the immunization process that countries employed to prevent higher mortality rates. However, that metric should not be taken as representing final government objectives in terms of vaccination. Full vaccination coverage has been the main goal for all countries since 2021. The percentage of persons fully vaccinated in Latin America is 64.5 percent (dashed line in Figure 2.3). In the Caribbean, this average is matched only by Antigua and Barbuda (66.5 percent). The rest of the Caribbean countries are below this average by at least 8 percentage points (St. Kitts and Nevis) and up to 38 percentage points (Jamaica).

Before presenting a firm-level analysis using IFPG Survey data, it is important to examine country-level information on the evolution of two indicators that are associated with economic development in the Caribbean,

Figure 2.3. Full COVID-19 Vaccination in the Caribbean (Percent)



Source: Prepared by the authors based on data from Our World in Data (n.d.).

and that were negatively affected by the pandemic: tourist arrivals and commodity prices. Figure 2.4 shows the evolution of these indicators prior to, during, and after the peak of the pandemic. Tourist arrivals in the Caribbean fell dramatically to below 6 million in 2020 after constant increases and a five-year average of 18.4 million (panel A). The corresponding decline in tourism expenditure affected small businesses and independent workers in the tourism industry.

Figure 2.4. Impact of COVID-19 on Caribbean Economic Growth

A. Tourism Arrivals and Expenditure

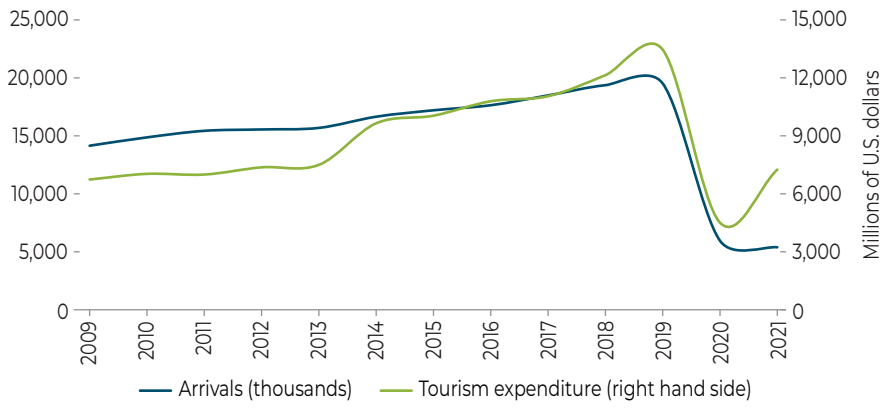


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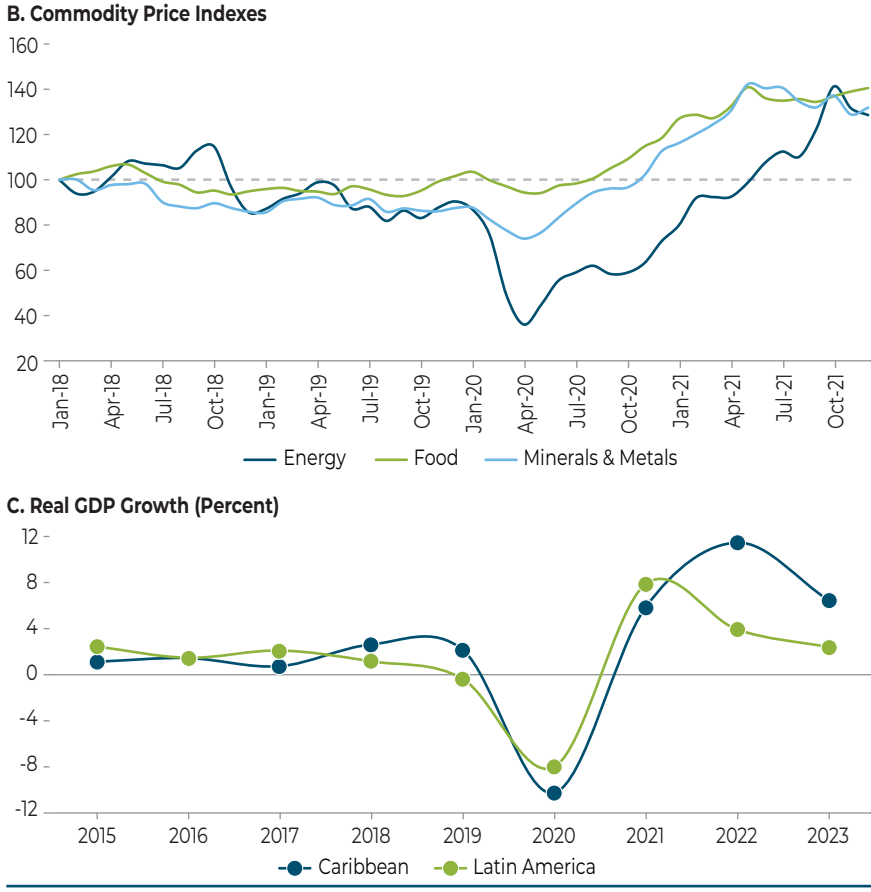
Figure 2.4. Impact of COVID-19 on Caribbean Economic Growth *(continued)*



Source: Prepared by the authors based on data from the United Nations World Tourism Organization Tourism Statistics Database, World Bank Commodity Price Data (The Pink Sheet), and the International Monetary Fund's World Economic Outlook database.
Note: The Caribbean includes Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. Latin America includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela.

The restrictions on movement imposed in most countries to slow the spread of COVID-19 also affected commodity prices. Panel B of Figure 2.4 shows how energy prices suffered a severe decline in 2020. Other commodity price indexes followed the same pattern, declining during 2020 and bouncing back after the decline. The negative shock in 2020 was typically followed by currency depreciation in commodity-exporting countries and other negative effects on trade balances, debt positions, and overall economic growth, as reflected in the decline in real GDP shown in panel C. The

supply shocks from the pandemic have also produced longer-term inflationary pressures (ECLAC 2022).

Panel C shows the evolution of real GDP growth from 2015 to 2022 in the Caribbean and the rest of Latin America. The decline in GDP in the Caribbean in 2020 was slightly larger than that of the rest of the region. While the post-pandemic recovery led the Caribbean to a better position through 2022, this was mainly driven by the economic performance of Guyana.[8]

Finally, while COVID-19 has exacerbated social gaps globally, Latin America and the Caribbean is one of the regions where the health and socioeconomic impacts of the pandemic have been the most severe. These impacts have placed the region on a difficult path toward recovery, and the war between the Russian Federation and Ukraine—and its consequences on commodity price volatility—along with the reigning inflationary pressures from 2022 are making the economic hurdles even harder to clear.

The firm-level analysis of the next section uses IFPG Survey data to provide a better understanding of the overall consequences of COVID-19 on Caribbean firms. While the time span during which data were collected does not allow for assessing the long-term effects of the pandemic on firm performance, the survey does provide relevant information about short-term effects and expectations in areas such as human resources, innovation, finance, strategy and management, and technical support.

2.3. Firm-Level Evidence

During March–November 2020, the IFPG Survey conducted interviews of 1,979 formal firms in 13 Caribbean countries.[9] The main objective was to collect comparable firm-level data on innovation, use of digital technologies, firm performance, gender, and business management practices. The selection of firms in the final sample was done using a stratified random sample to produce a final dataset that is representative at the regional level and for two aggregated sectors: (i) mining and quarrying, manufacturing, aquaculture, and fishing and (ii) services, retail, arts and entertainment, office, and business support. With the unexpected occurrence of the COVID-19 crisis, the original survey was expanded to collect information to measure its potential impact on Caribbean firms.

[8] If Guyana were to be excluded from average GDP growth of the Caribbean, the 2022 figure would stand at 7.3 percent instead of 11.5 percent.

[9] The countries included in the IFPG sample are Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago.

The analysis begins by analyzing subjective measures of the overall impact of the COVID-19 pandemic on Caribbean firms. It was clear from the onset that the pandemic would negatively affect business operations. Indeed, 89 percent of decision-makers at Caribbean firms qualified the overall impact of the pandemic as negative, while only 7.5 percent thought it was neutral (and 3.5 percent perceived it as positive). This information was explored in Acevedo et al. (2021), but that study focused only on The Bahamas, Barbados, Belize, Guyana, Jamaica, Suriname, and Trinidad and Tobago. Furthermore, firms were questioned about the likelihood of resuming their normal course of operations. Despite the pessimistic outlook described above, 76 percent of firm executives, on average, expected to resume the normal course of operations. The remaining 24 percent believed they were not likely to resume the normal course. Figure 2.5 shows the differences between countries. Firms that anticipated normal activities would resume expected that this would happen after 13 months, on average. That period varies by country, ranging from 10.6 months in Belize to 14.3 months in The Bahamas (panel A of Figure 2.5).

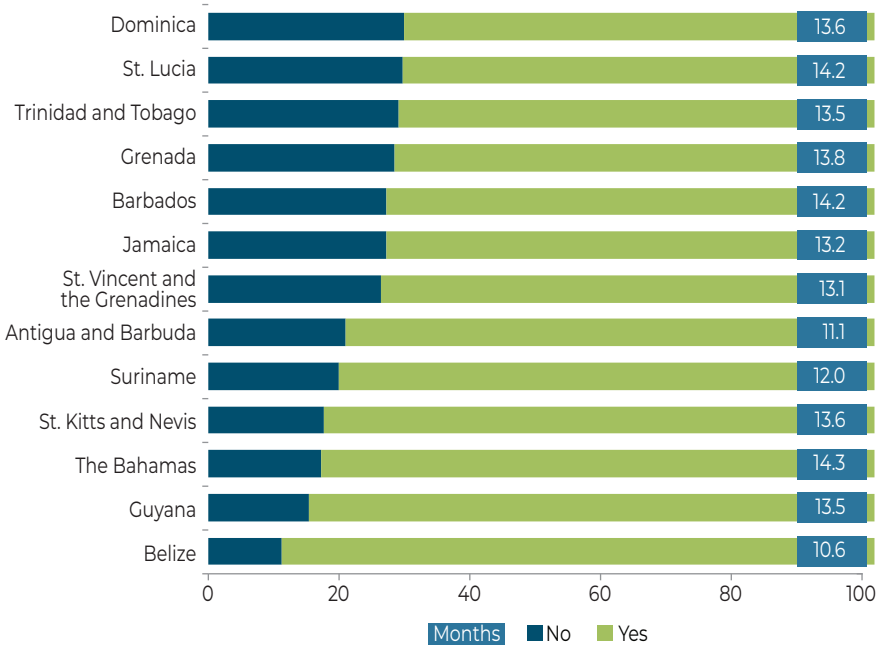
Expectations about the duration of the COVID-19 crisis—regardless of perceptions about the likelihood of resuming normal operations—also provide information about firm management decisions regarding human resources, investments, production, and operations management. Caribbean firms expected the crisis to last 25 months, on average (Figure 2.5, panel B). Belize, which had the highest share of firm managers stating that they would resume normal operations in the shortest time in the Caribbean, is also the country where firm managers expected the shortest duration of the crisis (16.4 months). On the opposite side of the spectrum, firm managers in Dominica expected the COVID-19 crisis to last 28 months. Moreover, small firms expected the crisis to last longer (25.5 months) than large firms (23.2 months) in the Caribbean sample. This relative pessimism could be associated with the harsher conditions these firms seem to face for their operations (see Chapter 3).

As noted by Ruprah, Melgarejo, and Sierra (2014) and Ruprah and Sierra (2016), innovation plays a key role in private sector development and overall economic growth. At the macroeconomic level, research and development expenditure reinforces innovation, productivity, competitiveness, and GDP per capita, leading to sustained economic growth. At the firm level, it reinforces more efficient use of firm resources to increase production.

Chapter 5 incorporates a descriptive analysis of the main barriers to innovation and the impact of innovating in terms of accessing new markets, increasing capacity, increasing sales, making quality improvements, or reducing average costs. It also includes information about transformation

Figure 2.5. Caribbean Firms' Likelihood of Resuming Operations and Their Expectation of the Duration of the Crisis

A. Likelihood of Resuming Operations and in How Many Months

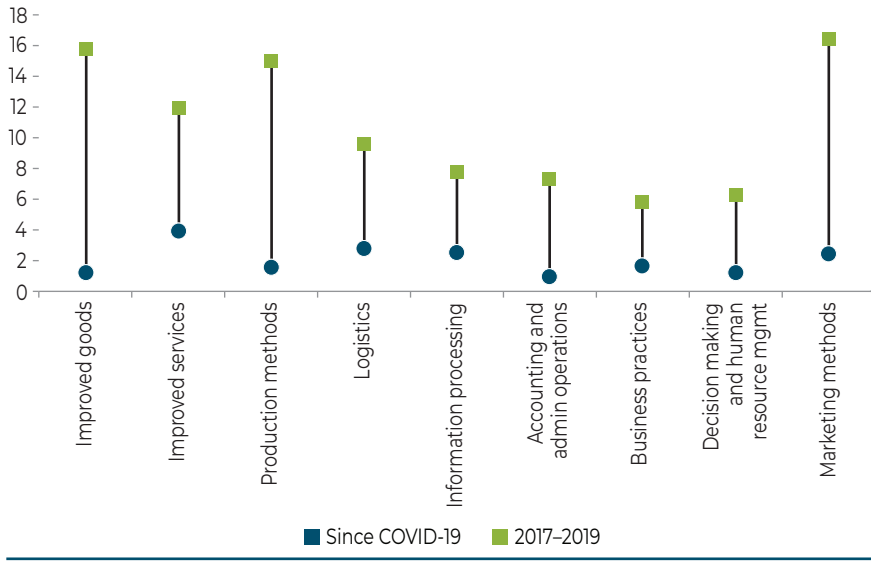


B. Expected Duration of the COVID-19 Crisis

Country	How long will crisis last (months)?
Antigua and Barbuda	22.74
The Bahamas	28.07
Barbados	27.67
Belize	16.40
Dominica	27.95
Grenada	28.04
Guyana	25.21
Jamaica	26.55
St. Kitts and Nevis	26.65
St. Lucia	26.45
St. Vincent and the Grenadines	24.43
Suriname	21.89
Trinidad and Tobago	24.64
Small	25.53
Medium	24.93
Large	23.21
Caribbean average	**25.09**

Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

Figure 2.6. COVID-19 and Innovation in the Caribbean (Percent of firms introducing new or improved products)



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

readiness and advanced digital technology use among Caribbean firms. However, there is valuable information gathered in the IFPG Survey about previous implementation of innovation activities and attempts to develop or introduce such activities since the advent of the COVID-19 crisis. While data were collected only after 4–8 months of WHO's declaration of the pandemic, the information sheds light about the short-term impact of the crisis on innovation efforts by Caribbean firms.

Figure 2.6 shows the substantial difference between innovation efforts in the three years prior to the survey and efforts at innovation after the pandemic in all kinds of innovation activities. Approximately 16 percent of firms introduced new or improved products during 2017–2019, but after COVID-19 that share was only 1.2 percent, a decline of 14.6 percentage points. A similar pattern is observed in innovation with regard to marketing methods for promotion, packaging, and pricing, and, to a lesser extent, in methods to produce goods or provide services. While the differences are not as large for the rest of innovation activities, it is telling that all innovation activities were substantially reduced after COVID-19 hit. Mohan and Strobl (2023) used the same data source to deploy a stochastic frontier approach (SFA) model to assess the impact of innovation on technical efficiency. They found that general innovation implemented before the pandemic had positive effects on efficiency and enabled firms to better adapt to challenges imposed by

the pandemic. Chapter 5 will highlight this and other relevant studies on innovation and firm performance.

As mentioned in Section 2.1, the short-term adjustment to employment (Apedo-Amah et al. 2020) was channeled through the granting of leave, reducing hours of work, or reducing worker wages, as opposed to laying off workers. The IFPG Survey collected data on the expected COVID-19 impact on human resources. Keeping in mind that the pandemic was still in its early stages when the survey was conducted, the following results still provide useful insights about human resource management going forward. Two out of three Caribbean firms expected the level and composition of their full-time permanent workforce to be affected by the COVID-19 crisis (dashed line in panel A of Figure 2.7). However, large firms and women-owned firms remained relatively more positive than the average: 59 and 62 percent of large firms and women-owned firms, respectively, expected the pandemic to have an impact on human resources, while 68 percent of both small firms and men-owned firms expected negative effects. There

Figure 2.7. COVID-19 and Human Resources in the Caribbean (Percent)

A. Share of Firms Expecting the Level and Composition of their Full-Time Permanent Workforce to be Affected

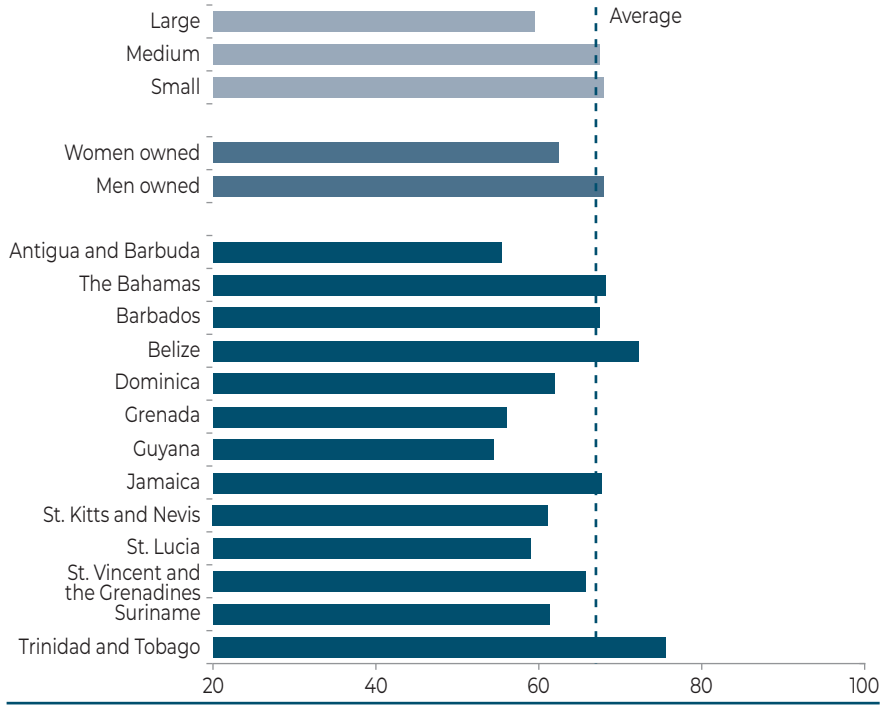


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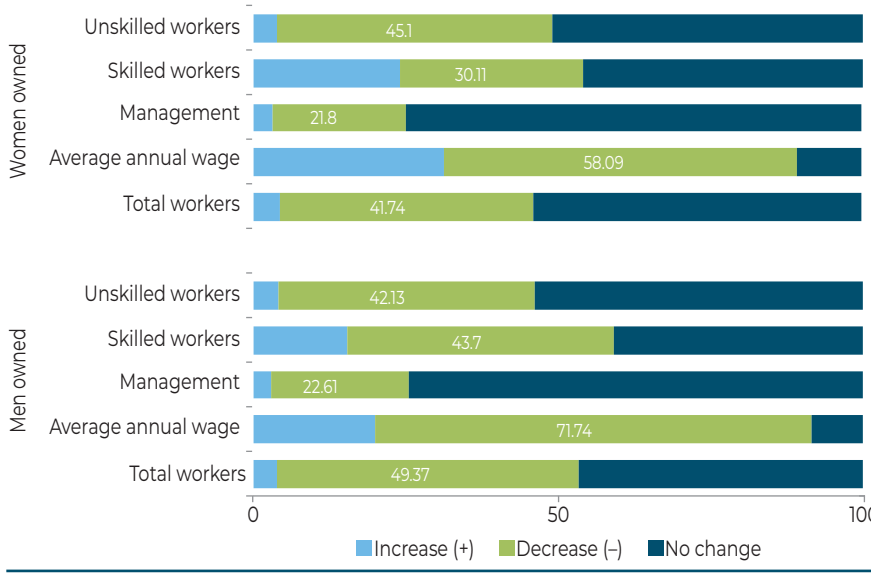
Figure 2.7. COVID-19 and Human Resources in the Caribbean (Percent)

B. Expectations of Men- and Women-Owned Firms about the Impact on Their Workforce in Five Areas



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

are also differences between countries, with only 54 percent of Guyanese firms expecting an impact compared to up to 75 percent of firms in Trinidad and Tobago.

The differences between women- and men-owned businesses require further analysis. The type of impact among firms that expected COVID-19 to affect their level or composition of full-time permanent workers was further explored in the IFPG Survey in five areas: total workers, average annual wages, management, skilled workers, and unskilled workers (panel B of Figure 2.7). Besides being more optimistic about the effects of the pandemic on human resources (panel A), the share of women-owned firms expecting a decrease in average annual wages (58 percent) was significantly lower than that of their male counterparts (71.4 percent, panel B). In fact, the only group for which a larger share of women-owned firms expected a decrease was for unskilled workers, and the difference with respect to men-owned firms was 3 percentage points (panel B).

Tacsir and Pereira (2023) used the IFPG Survey to analyze the impact of COVID-19 on the productivity and innovation of Caribbean firms with a focus on gender diversity and workforce composition. They found that

firms did not expect substantial reductions in overall employment but did expect a lower share of female employment. This would partially offset the direct impact of higher shares of female employment on labor productivity. Hence, protecting women's jobs is very important in terms of public policy, especially in the aftermath of external negative shocks such as COVID-19. Chapter 4 will provide an overview of the skill shortage issue raised consistently by Caribbean firms, focusing on its potential causes (as perceived by firm managers) and policy implications.

Besides damaging the economy overall, the COVID-19 pandemic negatively affected the financial performance of enterprises. It reduced global manufacturing capacity and affected supply chains, though it did make way for developing and improving e-commerce. Nguyen (2022) analyzed over 100 logistics firms listed in the Vietnam Stock Exchange and found that their financial performance did not improve during the pandemic. Moreover, their leverage ratio increased, and their profitability and efficiency ratios deteriorated. In addition, Haque and Varghese (2021) studied the impact of the COVID-19-related recession on the publicly listed capital structure of U.S. firms. They found that the average leverage (net debt/asset) of the firms decreased by 5.3 percentage points from the pre-shock mean of 19.6 percent and that debt maturity also increased moderately. Both studies point to the financial stress that firms experienced even in developed countries.

The analysis now turns to COVID-19-related information from the finance and accounting module of the IFPG Survey. The use of financial products is scarce among Caribbean firms. Overdraft facilities are the most common financial product used by firms, followed by credit cards, medium- and long-term loans, and lines of credit.[10] However, these products are used by only 30.3 percent, 22.3 percent, 18.1 percent, and 13.1 percent of firms, respectively. Furthermore, their use increased only marginally in the wake of the pandemic. For example, only 40 percent of firms that use a line of credit increased such use. As only 13.1 percent used a line of credit, this implies that, overall, only 5.3 percent of all firms increased the utilization of lines of credit in the wake of the pandemic (Table 2.1, last row).

Table 2.1 shows how the use of financial products is very modest among Caribbean firms. Chapter 6 discusses the reasons for this under-usage. However, having such financial instruments available to buffer the impact of external shocks is helpful for firms. This is especially true in a context in which 91.7 percent of Caribbean enterprises expected that the COVID-19

[10] Equity financing is almost nonexistent among Caribbean firms. For example, only 1.6 percent of Belizean firms use this financial product.

Table 2.1. COVID-19 and the Use of Financial Products in Caribbean Firms (Percent)

	Line of credit		Overdraft facility		Credit card		Medium/Long-term loans		Equity financing	
	Has financial product	Increased utilization due to COVID-19	Has financial product	Increased utilization due to COVID-19	Has financial product	Increased utilization due to COVID-19	Has financial product	Increased utilization due to COVID-19	Has financial product	Increased utilization due to COVID-19
Antigua and Barbuda	13.3	2.1	18.3	9.6	8.7	4.1	17.8	0.0	0.1	0.0
The Bahamas	14.1	4.6	26.3	11.7	40.1	3.1	25.9	0.0	0.0	0.0
Barbados	12.0	9.6	33.1	16.7	21.6	10.9	20.5	0.0	0.0	0.0
Belize	19.9	6.3	16.5	1.2	31.2	6.1	23.8	0.9	1.6	0.0
Dominica	13.0	2.1	35.2	18.7	21.8	6.1	15.3	0.0	0.0	0.0
Grenada	10.6	7.0	49.6	14.1	30.3	7.4	26.2	0.0	0.0	0.0
Guyana	15.3	6.1	28.1	16.5	6.4	3.8	11.6	2.5	0.0	0.0
Jamaica	8.0	3.1	27.3	11.1	15.8	2.7	12.8	0.0	0.0	0.0
St. Kitts and Nevis	8.6	2.3	30.6	12.2	12.5	1.6	11.7	1.0	0.0	0.0
St. Lucia	13.4	0.2	38.3	12.6	38.2	10.3	14.6	0.0	0.0	0.0
St. Vincent and the Grenadines	11.7	2.1	45.2	10.3	36.0	13.2	24.5	0.0	0.0	0.0
Suriname	15.2	6.2	20.4	5.2	16.9	2.0	18.9	3.0	0.0	0.0
Trinidad and Tobago	13.6	6.6	34.9	15.5	18.9	3.1	15.3	0.0	0.0	0.0
Small	9.1	2.1	18.8	5.9	14.9	4.8	13.0	0.1	0.1	0.0
Medium	18.1	9.4	40.6	16.8	27.2	3.8	21.1	0.8	0.1	0.0
Large	20.5	10.2	62.4	36.8	48.1	11.7	37.2	0.5	0.0	0.0
Total	13.1	5.3	30.3	12.6	22.3	5.2	18.1	0.4	0.1	0.0

Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

crisis would impact their total sales, and 96.1 percent of such firms estimated the impact to be negative (while only 3.9 percent expected an increase in sales).

Failure to use financial products in the Caribbean could translate into worse performance metrics in the presence of external shocks. A sizable shock such as the COVID-19 pandemic could harm the operations of firms in the short term and affect firm survival in the long term. These potential negative effects could be diminished using financial buffers and/or government support programs. Since the World Bank's 2010 Enterprise Surveys, lack of access to finance has been identified as one of the most severe obstacles faced by Caribbean firms. If the obstacle persists, it will likely act as an entry barrier for new small firms. These topics will be covered in Chapter 6.

2.4. Conclusions and Discussion

After being hit hard by the COVID-19 pandemic, governments in Latin America and the Caribbean reacted to contain the spread of the virus, protect their citizens in the short run through travel restrictions, lockdowns, public health campaigns, and economic stimulus packages, and reopen the economy afterward. However, the pandemic revealed some of the region's shortcomings in terms of health infrastructure, social protection systems, and the business environment.

All studies focusing on the effects of the COVID-19 pandemic in the region note that it had a pronounced negative impact on overall economic activity, health-related indicators, and other country-level metrics. Furthermore, the pandemic led to a decline in global tourism, making the Caribbean more vulnerable by affecting the major source of revenue and employment for most countries in the region. The resulting economic contraction in tourism-dependent countries was evident as they experienced a sharp decline in tourist arrivals. This had a direct impact on employment in sectors such as hospitality, travel, and entertainment. Many businesses had to scale down operations or temporarily close.

The firm-level evidence provided in this chapter confirms the general trend of the pandemic's negative effects on firms. Subjectively, 89 percent of Caribbean firms qualified the overall impact of the pandemic as negative. However, 76 percent of firm executives expected to resume the normal course of operations. Furthermore, Caribbean firms expected the crisis to last 25 months, on average, but the average expected length of the crisis was slightly higher among small firms relative to large ones. The chapter also provided evidence of the negative effects of the pandemic on

innovation efforts and labor force composition, along with slight changes in the use of financial resources.

Acevedo et al. (2021) provided further evidence of the negative effects of the pandemic in the form of reductions in sales (by 89 percent of firms in seven Caribbean countries) and capacity utilization (85 percent), with a lesser impact on labor (34 percent) and exports (25 percent). They also found that the pandemic shifted firms' priorities, with a greater focus on digital payments as a potential constraint to business operations. These results complement those provided in this chapter and point to a potential policy agenda for the Caribbean that should include investment facilitation programs for small firms, training mentoring programs to enhance the skills of the Caribbean labor force, and general policies to improve the business environment. The chapters that follow will delve deeper into some of these critical issues, including improvement of the investment climate, enhancement of local skills, the state of innovation, and access to finance by Caribbean enterprises.

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3

The Investment Climate: An Uphill Path for Most Caribbean Firms

Diether W. Beuermann and Ricardo Sierra

One of the hypotheses behind the performance gap observed in the Caribbean relates to weaker institutions leading to a weaker private sector (Ruprah, Melgarejo, and Sierra 2014). Beuermann and Schwartz (2018) completed a comprehensive review of the quality and adequacy of institutions in the Caribbean. They provided new insights into institutional design in the region by exploring the historical development and status of political and economic institutions. The authors highlighted the broad recognition that economic agents need to have certainty about the rule of law, feel secure about property rights, and know that they can rely on effective judiciary and political representation to carry out their respective activities in the economy. Besides the institutional setting examined in-depth in Beuermann and Schwartz (2018), the economic literature on improving the business environment for economic growth distinguishes several factors to achieve this, including the following:

- **Political environment.** A stable political environment with a predictable policy framework leads to better incentives for business owners to invest and generates overall confidence across all economic agents. This could be part of a broader basic foundation of stability and security, where governments can take direct steps to enhance the security of property rights.
- **Governance.** Transparent and accountable governments that are responsive to their citizens can create a conducive business environment for firms to operate successfully.
- **Regulatory environment and taxation.** Well-designed regulations provide a level playing field for all businesses in the economy while protecting consumers' rights. Such regulations also address market failures that inhibit productive investment, and they match the interests of firms and society. Sound taxation generates revenues to

finance public services that improve the investment climate (World Bank 2004; Loayza and Servén 2010).

- **Access to finance.** It is essential for businesses to start, grow, and expand in any economy. Achieving this requires access to capital, credit, and other financial services. Well-regulated financial markets connect firms to lenders and investors that are willing to share risk. On the other hand, financial obstacles produce entry barriers and increase costs for both small entrepreneurs and large multinationals.
- **Skilled workforce.** This is critical for businesses to compete in the global economy. Access to high-quality education and training programs helps workers develop the skills needed to perform efficiently and generate value. Government policies should positively affect labor markets in a way that fosters the connection between workers and jobs.

Fajnzylber, Guasch, and Lopez (2008) provided a comprehensive review of the business climate in Latin America and the Caribbean with a focus on the microeconomic foundations. Their main objective was to test whether the shortcomings in the region's growth performance (with respect to the world and other relevant benchmarks) can be separated from the microeconomic environment in which firms operate. They concluded that countries in the region need to improve their respective investment climate to achieve higher and more sustainable rates of economic growth. Many studies suggest there are various outstanding issues hindering economic growth in the region, but there is a lack of empirical evidence about firm performance as it relates to the various shortcomings.[1] It is important to use the firm as the unit of analysis because the production and investment decisions of firm managers directly affect levels of employment and aggregate growth. This chapter will provide an update on these issues in the context of the Caribbean and will also compare the 2020 metrics of the business environment with those that were in place in 2010.[2]

[1] These issues include the quality of governance and institutions, physical infrastructure, financial sector development, the human capital of the labor force, and the innovative capacity of the private sector. The institutional issues are well documented in Schwartz and Beuermann (2021), and the physical infrastructure shortcomings are beyond the scope of this book. However, the remaining issues are covered in different chapters of this book.

[2] The main source for the 2020 metrics is Compete Caribbean's Innovation, Firm Performance, and Gender Survey, available at Compete Caribbean, https://www.competecaribbean.org/proteqin-ifpg-datasets/; the main source for the 2010 metrics is

Another flagship report that covers the global investment climate is the World Development Report (World Bank 2004), which focuses on the importance of creating an environment where firms and entrepreneurs of all types have incentives to invest productively, create jobs, expand their operations, and, hence, contribute to overall economic growth. While some progress was evident in some countries at the time when the report was issued, many other governments were lagging in the investment climate agenda. Non-technical regulatory burdens on firms impose preventable costs, create an environment of uncertainty and risk, and generate barriers to competition. The report relied on research about the effects of the business environment on overall economic growth, firm-level data on over 30,000 firms around the world, and country case studies to reach the following main messages:

- **Inclusiveness.** An improved investment climate is needed for all, which means that well-designed regulations and taxation schemes (two important pillars of investment climate) should benefit society as a whole and not only firms. Among firms, the investment climate needs to embrace the entire private sector: small and large firms, local and foreign-owned firms, and firms in all industrial sectors.
- **Broader focus.** The investment climate needs to go beyond reducing business costs. Policy-related risks are abundant in developing countries and diminish incentives to invest. Similarly, competition should be promoted so that firms have incentives to innovate and increase productivity.
- **Implementation of policies.** There is a need to reduce existing gaps between formal policies and their implementation. To this end, governments need to address rent-seeking behavior in all areas of government that deal with the private sector, tackle corruption, and foster public trust in the community.
- **Strategic improvements.** It is hard to implement policy interventions with such a broad agenda. Therefore, starting with gradual changes to address pressing concerns will compound over the long term and give firms confidence to invest and sustain ongoing improvements over time.

Considering these messages, this chapter aims to provide an update on the business environment in the Caribbean. The chapter first presents country-level evidence on the evolution of aggregate investment and pro-

the World Bank Enterprise Surveys, available at https://www.enterprisesurveys.org/en/enterprisesurveys.

ductivity in the previous two decades. Firm-level evidence about business environment is then presented using data from the Innovation, Firm Performance, and Gender (IFPG) Survey.[3] The chapter concludes by exploiting previously collected firm-level data to further investigate the changes in the business environment over time going back to 2010.

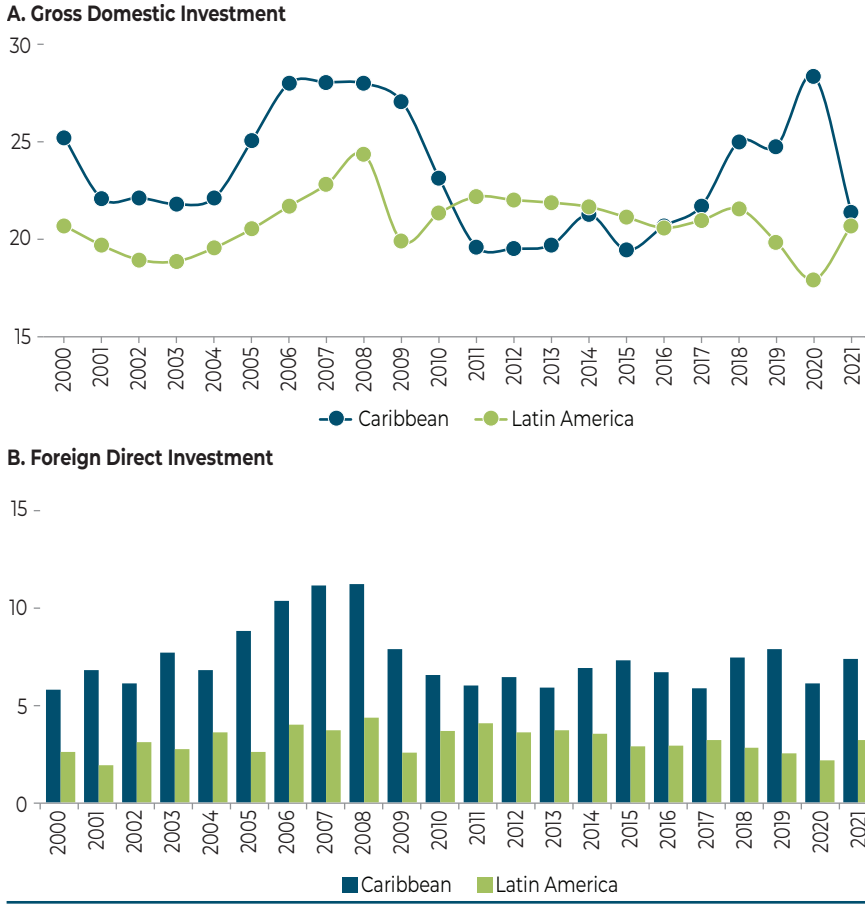
3.1. Evolution of Country-Level Indicators

Growth underperformance in the Caribbean examined by Ruprah, Melgarejo, and Sierra (2014) and Ruprah and Sierra (2016) stems from several structural factors. Nonetheless, within the context of the business environment, Fajnzylber, Guasch, and Lopez (2008) provide two main reasons that explain per capita growth rates across countries: capital accumulation (investment) and factor productivity. The former is based on the neoclassical growth models of Cass (1965), Koopmans (1963), Solow (1956), and Romer (1986), which emphasize the role of capital accumulation as the source of economic growth. The latter is based on more recent literature that argues that cross-country variations in GDP growth are mostly driven by differences in total factor productivity (TFP). Bosworth and Collins (2003) use a comprehensive country dataset consisting of 84 countries for 1960 to 2000 to estimate growth accounts and growth regressions. They find that TFP accounted for 40 percent of output growth during the 1960–2000 period.

Looking at both drivers of growth described above allows for assessing whether the Caribbean has improved in these metrics over time. First, we consider private investment as the channel through which a better investment climate captures more inputs to the production process and encourages economic growth. Figure 3.1 (Panel A) shows how domestic investment in the Caribbean was slightly higher than the rest of the Latin America and Caribbean region over 2000–2010. During this period, the differences between the Caribbean and the rest of the region ranged from 1.8 to 7.1 percentage points and averaged 4 percentage points. After that, investment in the Caribbean was relatively lower than the regional average for five consecutive years, averaging 19 percent of GDP (compared to 21.7 percent for Latin America). In 2016, the relation was again reversed and reached a peak of a 28.3 percent average for the Caribbean in 2020, driven mainly by a steep increase in Antigua and Barbuda (Figure 3.1, panel A). After this spike, investment in the Caribbean slowed and returned to a figure closer to 20 percent of GDP, very similar to the figure observed in the rest of the region during 2021.

[3] See Compete Caribbean, https://www.competecaribbean.org/proteqin-ifpg-datasets/.

Figure 3.1. Investment in Latin America and the Caribbean, 2000–2021 (Percent of GDP)



Source: Prepared by the authors based on data from the World Bank, World Development Indicators.
Note: The Caribbean category includes Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. The Latin America category includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela.

Foreign investment has become particularly important for developing countries, and the Caribbean has received some of the highest levels of foreign direct investment (FDI) in the world. This means a high percentage of economic activity in the Caribbean is conducted by transnational companies, which makes the business environment even more important. FDI has been consistently higher in the Caribbean when compared to the rest of Latin America (Figure 3.1, panel B). Some of the factors behind the increase in FDI over 2000–2008 are related to a rise in internal demand and some privatization

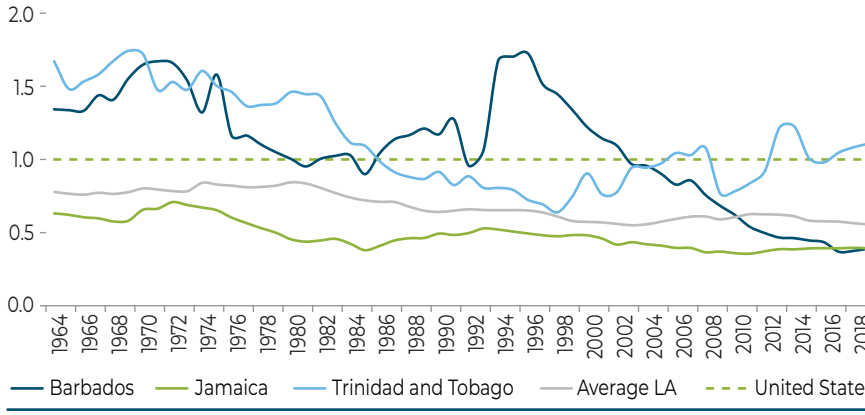
and liberalization programs in telecommunications and electricity (De Groot and Pérez Ludeña 2014). However, the global financial crisis disproportionately affected the Caribbean, and FDI inflows have not fully recovered since.

The previous evidence provides some positive news about investment in the Caribbean. However, that optimism vanishes when one considers the performance of Latin America and the Caribbean with respect to other regions and income groups. Fajnzylber, Guasch, and Lopez (2008) show how, in the early 2000s, the only region with lower investment rates than Latin America and the Caribbean was sub-Saharan Africa, also averaging around 20 percent of GDP. When further analyzing the relationship between investment and growth, the authors found that the region's investment had a low return in terms of its growth payoff. This is important because it shows that growth strategies relying only on increasing investment without addressing constraints to productivity may not be enough for the region to catch up.

The economics literature on the second factor associated with economic growth, TFP, dates to the 1950s and is based on a neoclassical production function that relates output (Y) to physical capital (K), labor (L), and the level of TFP (A) through a Cobb-Douglas production function: $Y = AK^{\alpha}L^{1-\alpha}$. It follows that $\widehat{TFP} = \widehat{GDP} - S_K * \hat{K} - (1 - S_K) * \hat{L}$, where S_K is the share of capital in income. Therefore, TFP growth is the part of GDP growth that is not explained by capital growth and labor growth. This is usually referred to as a measure of technological change. It has been considered to be a driver of long-run economic growth and a very important indicator of an economy's health. As Krugman (1997) pointed out in his popular guide to the U.S. economic landscape of the 1990s: "Productivity isn't everything, but in the long run it's almost everything." It is important to note, however, that long-term production functions use capital stock time series obtained from ad hoc estimates of the rate of depreciation and the initial capital stock. Baca Campodónico and Reyes (2023) propose a new methodology to use an econometric estimation of the capital stock, the production function parameters, the depreciation rate, and the initial capital stock using a system of equations. The authors use the proposed methodology to estimate TFP for The Bahamas, Barbados, Jamaica, and Suriname for the 1989–2019 period.

Other studies have shown that TFP growth has not been particularly high in Latin America and the Caribbean. Fajnzylber, Guasch, and Lopez (2008) showed that for all periods except 1971–1975 and 1991–1995, TFP growth in the region was relatively lower than that in most other regions of the world. They pointed out, however, that there is significant country heterogeneity within the region, and they highlighted Trinidad and Tobago's exceptional TFP growth during 2001–2005. This growth rate was double that of Ecuador (the country with the second-largest TFP growth in Latin America

Figure 3.2. Total Factor Productivity, 1964–2018



Source: Prepared by the authors based on data from Penn World Table 10.01.
Note: LA: Latin America.

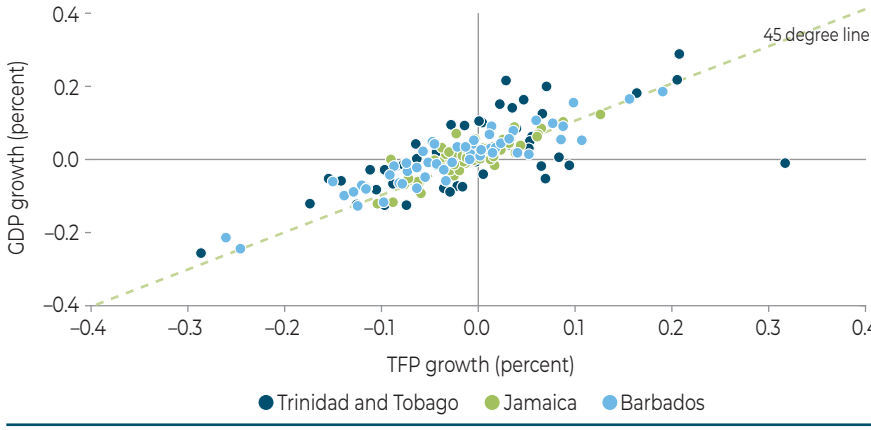
and the Caribbean) and contrasted starkly with the rates of El Salvador and Mexico, which had negative growth rates during the same period. Finally, the authors assessed the relevance of TFP in explaining growth fluctuations and found that differences in factor productivity may explain, on average, three-fourths of cross-country differences in GDP growth rates.[4]

Unfortunately, comparable country-level data for TFP are limited in the Caribbean. In the Penn World Table initiative, a country-level database with information on relative levels of income, output, input, and productivity covering 183 countries for 1950–2019, the only Caribbean countries with TFP data are Barbados, Jamaica, and Trinidad and Tobago. Figure 3.2 shows TFP levels at current purchasing power parity (where United States = 1) for these Caribbean countries and the average of Latin America.[5] The outstanding TFP levels observed for Trinidad and Tobago are consistent with the findings in Fajnzylber, Guasch, and Lopez (2008). Trinidad and Tobago has relatively higher TFP levels than the average in Latin America for all years. Furthermore, the country's levels are relatively better when compared to the U.S. benchmark during 1965–1984 and in the last five years covered (2015–2019). TFP declined starting in 1982 and recovered starting in 1999 in Trinidad and Tobago.

[4] For their component analysis, Fajnzylber, Guasch, and Lopez (2008) assume a 7 percent depreciation of the capital stock and an initial capital-to-output ratio of 5.

[5] A computed simple average for the following countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Peru, Uruguay, and Venezuela.

Figure 3.3. Total Factor Productivity Growth and GDP Growth (Percent)



Source: Prepared by the authors based on data from Penn World Table 10.01.
Note: TFP: total factor productivity.

Unlike Trinidad and Tobago, Barbados had relatively higher TFP levels that peaked in 1996, a year after which it experienced a steep decline that currently places Barbados in a worse-off position than its Caribbean peers. The evolution of TFP in Jamaica has been less volatile but steadily below the average for Latin America, ranging between 52 and 90 percent of the regional average for the entire period.

As previously mentioned, changes in TFP growth are associated with and can explain up to 75 percent of GDP growth (Fajnzylber, Guasch, and Lopez 2008). To validate this result with fresher data, one can look at per capita GDP and TFP growth rates for the three Caribbean countries with available data. Figure 3.3 displays the scatter plot for these variables. The lower volatility that was observed in Figure 3.2 for Jamaica translates into a higher concentration of data points toward the origin (green markers). In contrast, Barbados and Trinidad and Tobago have more dispersed data points in the plane.[6] However, the positive relationship between TFP growth and (per capita) GDP growth is clear, at least for the pooled data from these Caribbean countries.

We have seen the evolution of the two main factors that explain per capita growth rates across countries in the business environment literature: capital accumulation (investment) and factor productivity. The Caribbean fares relatively well with respect to the rest of Latin America in terms of investment, mainly driven by FDI. However, the region has been consis-

[6] For visual purposes, a single data point is not displayed in Figure 3.3. It corresponds to the pair (0.64, 0.58) for Barbados in 1994.

tently underperforming when compared to other regions of the world, and its investment has had low returns in terms of its growth payoff. Also, while Trinidad and Tobago has had relatively higher TFP rates than most countries in Latin America and the Caribbean, there is evidence that the region has lacked capacity to efficiently use and improve the inputs of production (Fajnzylber, Guasch, and Lopez 2008).

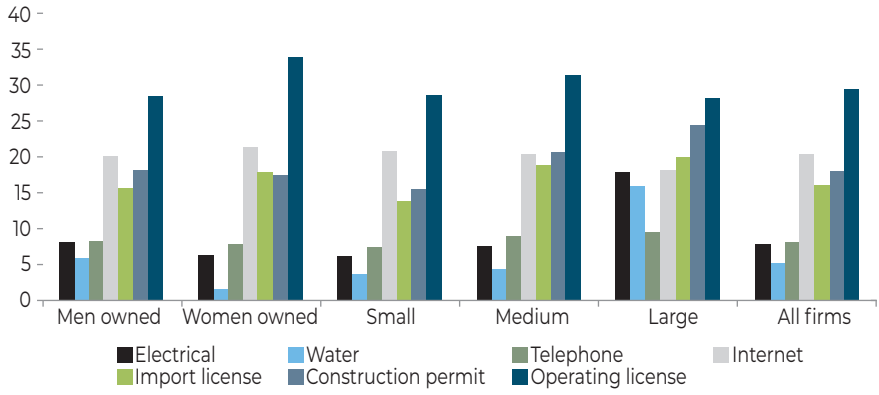
The next section focuses on firm-level data to measure the business environment that prevailed in the Caribbean during 2020. The IFPG Survey dataset contains information that allows for proxying for the investment climate in which firms operate. The investment climate module of the survey captures the occurrence of events such as requesting an electricity, water, telephone, or Internet connection, an import license, a construction-related permit, or an operating license. For each of these events, the IFPG Survey explores the number of days it took to obtain the relevant connection/license since the day of the request and whether an informal gift or payment was expected or requested. The information from these variables, along with the perception of business obstacles and the occurrence of service outages/interruptions, provides useful insights into the business environment in which Caribbean firms operate.

3.2. Firm-Level Analysis

Firms can face substantial burdens to operate if utility services are unreliable, inefficient, and/or costly. Before trying to assess utility services in the Caribbean, it is worth looking first at the percentage of firms that requested the services in the first place. An enabling business environment would be one where the utility service is provided and made fully functional in a short amount of time. Furthermore, it would be desirable that no informal payment or gift be expected or requested for the provision of the service.

Caribbean firms rarely have to request an electrical, water or telephone connection. In contrast, requests for Internet connections, import licenses, construction-related permits, and operating licenses are more frequent among all firms. Figure 3.4 shows how, on average, less than 10 percent of all firms request electricity, water, or telephone connections, while 20.5 percent of firms request Internet connections. In terms of import licenses, construction permits, and operating licenses, they are requested by 16.2 percent, 18.3 percent, and 29.7 percent of firms, respectively. Therefore, operating licenses are the most frequently requested by Caribbean firms, and they also have the largest gender gap: 28.6 percent of men-owned businesses compared to 34.2 percent of women-owned enterprises put in such requests.

Figure 3.4. Requests for Utility Connections and Permits in the Caribbean (Percent)



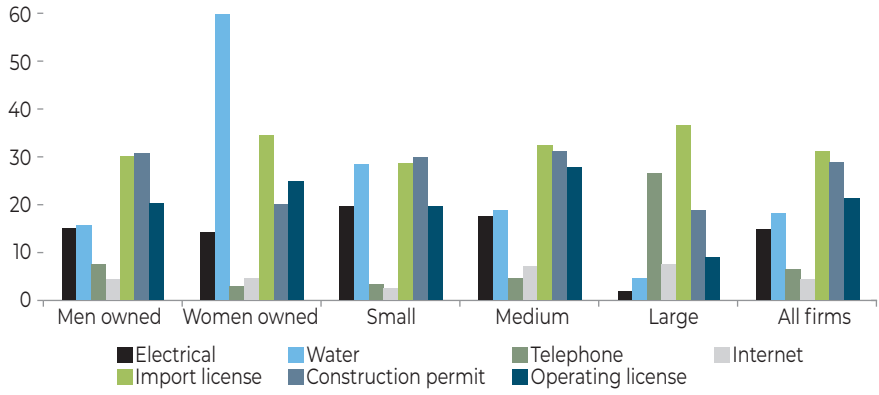
Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

The average number of days it takes for all firms to obtain the services described above range from 18.5 days for operating licenses to 57 days for construction-related permits. However, size and gender differences are significant for some services. For example, small and medium-sized firms wait, on average, approximately 52 days to get a construction-related permit, while large firms must wait 89 days to get such a permit. While this could be related to the nature or magnitude of the construction, it suggests a heavier burden on larger firms. The connection process for basic utility services such as electricity, water, telephone, and the Internet can be governed by numerous laws and regulations and include various entities. An enabling business environment would be such that all participating actors involved in providing these services are aligned and install new connections promptly. The country's quality of infrastructure will then influence the quality and efficiency of the service provided, directly affecting the business climate for all firms.

An interesting benchmark exercise exploiting previously collected datasets allows for comparing the average number of days it took to obtain an electricity, water, and telephone connection in 2010 vis-à-vis 2020. In the interim, the exercise considers provision of basic utility services and permits/licenses with respect to the added costs to obtain these services via informal payments or gifts. Kaufmann and Wei (2000) and Svensson (2003) examined the relationship between bribes and overall costs or other subjective measures. Kaufmann and Wei (2000) used firm-level surveys to determine that firms that pay more bribes are also likely to face higher costs of capital and to spend more time with bureaucrats dealing with regulations.

Informal payments to obtain basic utility services or licenses could be the first symptom of a larger corruption problem that hinders firm perfor-

Figure 3.5. Informal Payments to Obtain Service Connections and Permits in the Caribbean (Percent)



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

mance. Figure 3.5 shows how the prevalence of informal payments is more pronounced in the services already found to receive relatively more applications: import licenses, construction-related permits, and operating licenses. For those services, 31 percent of firms that applied for an import license had to make informal payments or gifts to obtain them. Since 16.2 percent of firms applied, this figure amounts to 5 percent of all firms that had to "grease the wheels" to get things done.

Similar overall percentages are observed for construction-related permits and operating licenses. The added costs for these permits seem to affect firms disproportionately. Approximately 31 percent of small and medium-sized firms had to make informal payments to obtain a construction-related permit, compared to 19 percent of large firms. This could be related to the previous result regarding the time taken to get this specific permit. Is it really the nature of the construction being undertaken by large firms that drove the relatively higher wait time (by 37 days, on average)? Or is it that, by making informal payments, small and medium-sized enterprises were able to receive preferential treatment and reduce the waiting time for these licenses to be granted?

Another interesting feature of Figure 3.5 is related to the substantial difference in the proportion of women-owned firms that had to make informal payments when applying for a water connection (60 percent). This is significantly higher than the 15.5 percent for men-owned firms. Overall, the percentage among all firms is similar between women- and men-owned firms because the percentage of men-owned firms applying for water connections is 3.5 times that of women-owned enterprises. However, it is striking that such a high percentage of women-owned firms made informal

payments for their water connection. Firms paying bribes to obtain public services (electricity, telephone, water, etc.) has been used as a proxy for the degree of corruption and has been shown to have a negative effect on firm labor productivity and TFP (Fajnzylber, Guasch, and Lopez 2008).[7]

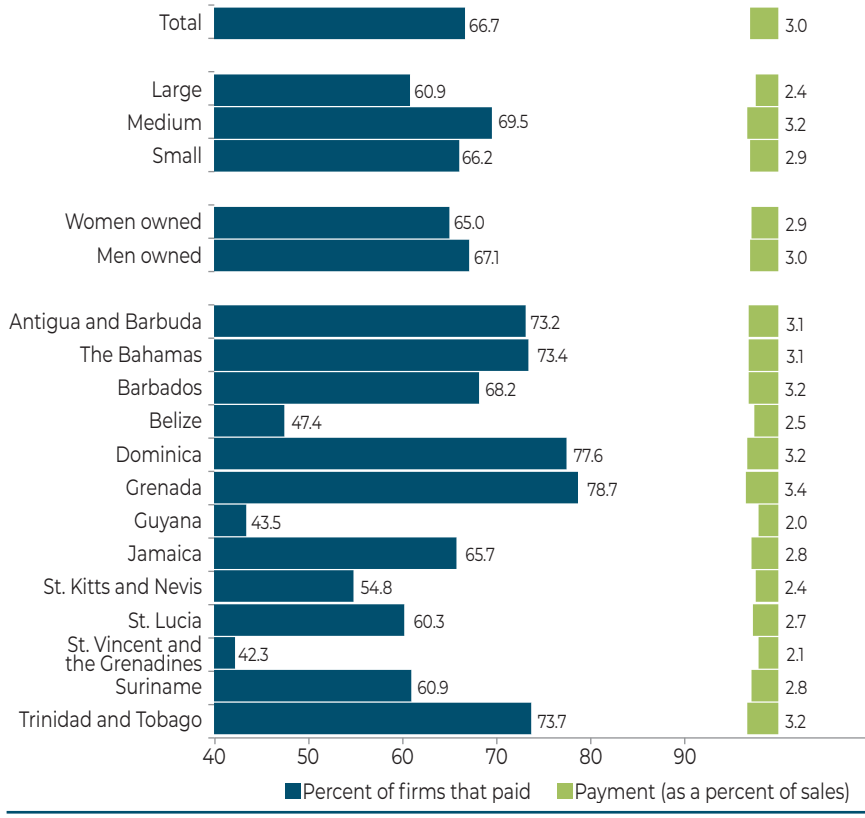
This type of rent-seeking behavior is detrimental to the business environment. It directly increases the costs of doing business and generates policy distortions. Using early rounds of Investment Climate Surveys, the World Bank (2004) estimated that 68.8 percent of firms in Latin America and the Caribbean reported paying bribes, with an average amount totaling 7 percent of sales. These types of payments are prevalent in two-thirds of Caribbean firms (Figure 3.6). The share of establishments required to make gifts or informal payments to public officials to "get things done" varies by country. It can reach up to 78 percent of firms (Dominica and Grenada) but is less frequent in St. Vincent and the Grenadines (42 percent) and Guyana (43 percent). Additionally, the reported amounts of informal payments average 3 percent of annual sales in the Caribbean. Figure 3.6 shows the low variability (by country, gender, and size) of payments as a percentage of annual sales. However, taking only the regional average and adding the 3 percent estimated losses due to outages, one can see how a firm's costs can increase substantially in a seemingly weak business environment.

Once the service is provided, a country's quality of infrastructure and the reliability of providers will directly affect a firm's operations. Cole et al. (2018) used firm-level data from 14 countries in sub-Saharan Africa to show a negative relationship between unreliable electricity supply and firm sales. They also found that reducing average outage levels to those of South Africa would increase overall sales by sub-Saharan firms by 85.1 percent. The prevalence of service outages in the Caribbean is substantial, especially for power and Internet access (Figure 3.7), services for which 67 and 58 percent of firms experienced an outage, respectively.

The number of outages/interruptions in the Caribbean in a typical month averages 2.6, 3.2, and 3.1 for electricity, mobile phone, and the Internet, respectively. But the frequency of outages is different depending on firm size. Large firms experience the lowest number of power outages in a typical month but have the highest number of mobile phone connec-

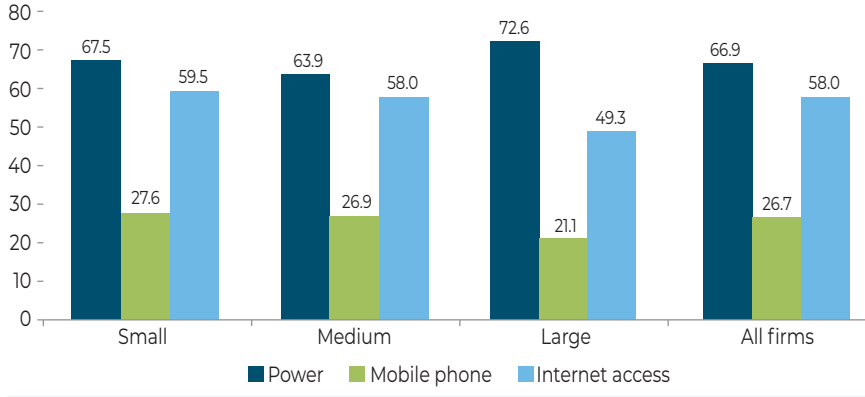
[7] We computed simple averages of sales per worker and TFP for two groups of firms: those that made at least one informal payment and those that did not. We find that both performance metrics are higher among bribing firms. The initial result by Fajnzylber, Guasch, and Lopez (2008) was no effect of bribes on the log of sales per worker, but the variable turned significant using a two-stage least squares regression analysis.

Figure 3.6. Informal Payments to Public Officials in the Caribbean (Percent)



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

Figure 3.7. Service Outages in the Caribbean (Percent)



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

tion interruptions (Table 3.1). Furthermore, the country with the most unreliable power service is Guyana, where firms experience an average of 5.1 outages in a typical month compared to 2 in Trinidad and Tobago. Internet access unreliability is similar: Guyana has the highest number of monthly outages of Internet access with 5.8, followed by Belize, with 5. Belize also stands out as having the highest frequency of interruptions in mobile phone connections.

Short-duration outages/interruptions might not affect the operations of an enterprise, but the average duration of power outages in the Caribbean is 2.7 hours. Suriname stands out in this regard. While Guyana and Belize have the most outages/interruptions in a typical month, Suriname has them for the longest periods of time. The average duration of outages in power, mobile connection, and Internet access In Suriname is 3.2 hours, 6 hours, and 8 hours, respectively (Table 3.1).

If all three services are considered equally important for business operations, it is easy to compute the total average hours of outages experienced by firms (i.e., number of outages times average duration). Moreover, the IFPG Survey collected data on firms' estimated losses in annual sales, so the total for all three services was computed as well. These metrics are shown in the last two columns of Table 3.1. Caribbean firms experience an average of close to 11 hours of outages in a typical month. Total outage hours in Barbados, Dominica, Guyana, and Suriname are higher than this average. In contrast, Grenada (5.3 hours of outages per month) and St. Kitts and Nevis (6.3 hours) seem to have the most reliable services in the region, with the lowest total hours of outages.

Finally, estimated losses with respect to annual sales are shown in the final column of Table 3.1. Caribbean firms that experienced any outage or service interruption lost, on average, 2.2 percent of their annual sales. There is less variability with respect to gender or firm size. However, firms' estimated costs are significantly higher in some countries. Consistent with having the highest number of outage hours in the region, Surinamese firms also estimate the highest losses, at 4.1 percent of their sales. In contrast, firms in Grenada lose only 1.1 percent of their sales (on average), having the least amount of outage hours per month (5.3 hours).

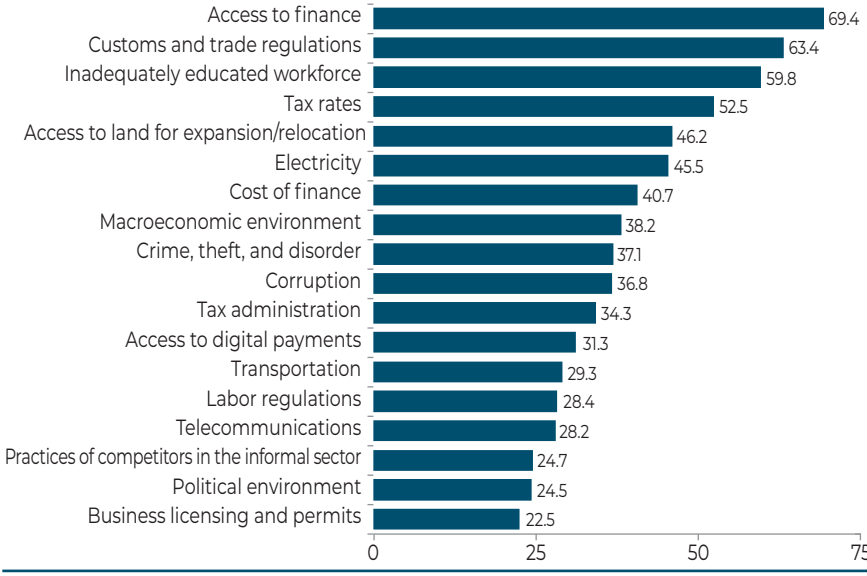
Turning to entrepreneurs' perceptions about the main obstacles to their operations, most of the constraints listed in the 2020 IFPG Survey can be traced to the 2014 Productivity, Technology, and Innovation (PROTEqIN) Survey and 2010 World Bank Enterprise Surveys (WBES) datasets. However, the IFPG Survey included a new constraint: access to digital payments. Gelb et al. (2007) have already shown the relevance of subjective data to understand investment climate constraints. They find that firms across African

Table 3.1. Frequency, Duration, and Cost of Outages/Interruptions in Caribbean Countries

	How many in a typical month?			How long (hours) on average?				
	Power	Mobile phone	Internet access	Power	Mobile phone	Internet access	Total hours of outages	Losses (Percent sales)
Antigua and Barbuda	2.27	3.38	2.79	2.04	1.52	1.83	7.59	1.1%
The Bahamas	2.91	3.51	2.62	2.54	2.07	2.25	10.84	2.8%
Barbados	2.75	3.21	4.82	3.67	1.47	2.40	14.34	2.7%
Belize	3.07	9.73	5.07	3.38	1.40	2.78	9.98	0.5%
Dominica	3.04	3.67	3.04	2.77	1.67	2.47	14.82	2.8%
Grenada	2.40	1.85	2.42	2.10	1.13	1.89	5.35	1.1%
Guyana	5.19	2.36	5.81	2.46	4.44	3.80	17.12	1.5%
Jamaica	2.21	2.94	2.72	2.12	1.81	1.98	8.85	2.8%
St. Kitts and Nevis	2.87	2.73	2.55	2.25	0.93	1.68	6.32	1.1%
St. Lucia	3.06	2.81	2.47	2.43	1.61	2.10	8.71	1.5%
St. Vincent and the Grenadines	2.45	2.76	2.42	2.89	2.42	2.24	8.20	1.3%
Suriname	2.46	2.98	3.35	3.23	6.01	8.02	23.73	4.1%
Trinidad and Tobago	2.08	2.81	2.64	2.87	1.41	2.24	8.66	2.2%
Men owned	2.69	3.20	3.21	2.70	1.83	2.65	10.94	2.1%
Women owned	2.37	3.24	2.97	2.89	2.30	2.23	10.89	2.6%
Small	2.66	3.29	3.05	2.85	1.91	2.49	10.90	2.2%
Medium	2.77	2.93	3.52	2.77	1.92	2.74	12.13	2.2%
Large	2.06	3.78	2.63	2.09	1.85	2.46	7.39	2.3%
All firms	2.63	3.21	3.16	2.74	1.91	2.57	10.93	2.2%

Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

Figure 3.8. Constraints to Business Operations in the Caribbean (Percent)



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

countries do not complain indiscriminately but rather exercise judgment when evaluating the seriousness of the constraining factors.

Figure 3.8 presents the list of constraints reported in the 2020 IFPG Survey. The subjective valuation of these constraints is coded into five categories, ranging from "no obstacle" to "very severe obstacle." The analysis here follows the same methodology used in Ruprah, Melgarejo, and Sierra (2014) to identify firms that consider an obstacle to be major or very severe. Among Caribbean firms, 70 percent consider access to finance (e.g., collateral) to be an obstacle to their operations. This is followed by customs and trade regulations (63.4 percent), an inadequately educated workforce (59.8 percent), and tax rates (52.5 percent). The issues of an inadequate workforce and access to finance are addressed in Chapters 4 and 6, respectively.

Business licensing and permits ranking lowest among the constraints contrasts with the previous results that pointed to a longer wait time to obtain these and to the presence of informal payments. One potential explanation for this is that only 16.2, 18.3, and 29.7 percent of firms applied for import licenses, construction permits and operating licenses, respectively. On the other hand, access to finance could be a broader issue that is discouraging most Caribbean firms. These hypotheses will be covered in Chapter 6, but it should be noted that access to finance has been considered a major obstacle for firms in Latin America and the Caribbean since the

release of the 2010 WBES. The next section will provide a broader analysis by comparing some metrics over time.

This section concludes by investigating the relationship between the business environment and firm performance.[8] An indicator for an enabling business environment is constructed to test whether firms that operate in a business-friendly environment have better performance metrics than their peers. The indicator captures various issues that have been discussed in this chapter, taking the value of one when (i) the firm did not have to make informal payments to obtain utility services or permits; (ii) the firm had zero estimated losses due to outages in any service; (iii) the firm did not incur informal payments to public officials (other than to obtain utility services or permits); and (iv) the firm does not consider business licensing and permits, corruption, and customs and trade regulations to be a major obstacle for its operation.

This strict definition of a business-enabling environment reduces the proportion of firms that operate in this positive environment to 4 percent of the sample. Of note, 87 percent of these firms are men owned, indicating relatively unfavorable conditions for women-owned firms (Table 3.2). The differences in performance metrics are sizable. Men-owned firms operating in a non-enabling environment (representing 77.7 percent of the total) have average labor productivity (measured as sales per person employed) of US$54,210, while men-owned firms operating in a business-friendly environment have, on average, 44 percent higher labor productivity (US$78,492). The differences

Table 3.2. Business Environment and Firm Performance in the Caribbean

Enabling Environment?	Metric	Men Owned	Women Owned
No	Firms (Percent of total)	77.7%	18.2%
Yes		3.5%	0.49%
No	Sales per worker (U.S. dollars)	54,210.6	55,922.6
Yes		78,492.8	178,381.3
No	TFP	2.850	2.715
Yes		3.292	5.285

Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.
Note: TFP: total factor productivity.

[8] Notice that the presented relationships do not imply causal associations as many unobserved components might be affecting the business environment and firm performance simultaneously within a cross-section. This underscores the importance of collecting panel data which allows to remove time-invariant unobservable factors from these relationships.

among women-owned business are even greater. A non-enabling environment for women-owned businesses translates to average labor productivity similar to that of men-owned firms (US$55,922). But for women-owned firms operating in an enabling business environment, average labor productivity is 3.2 times higher at US$178,3813. This is encouraging news in terms of policy interventions aimed at improving the business environment. While these could not be easily targeted to women, even as overall policy changes they could positively affect women-owned business tremendously and ultimately increase overall growth. The previous results are similar when using TFP as the performance metric. An enabling business environment is correlated with higher TFP across the board, but it is significantly higher for the few women-owned enterprises operating in it.

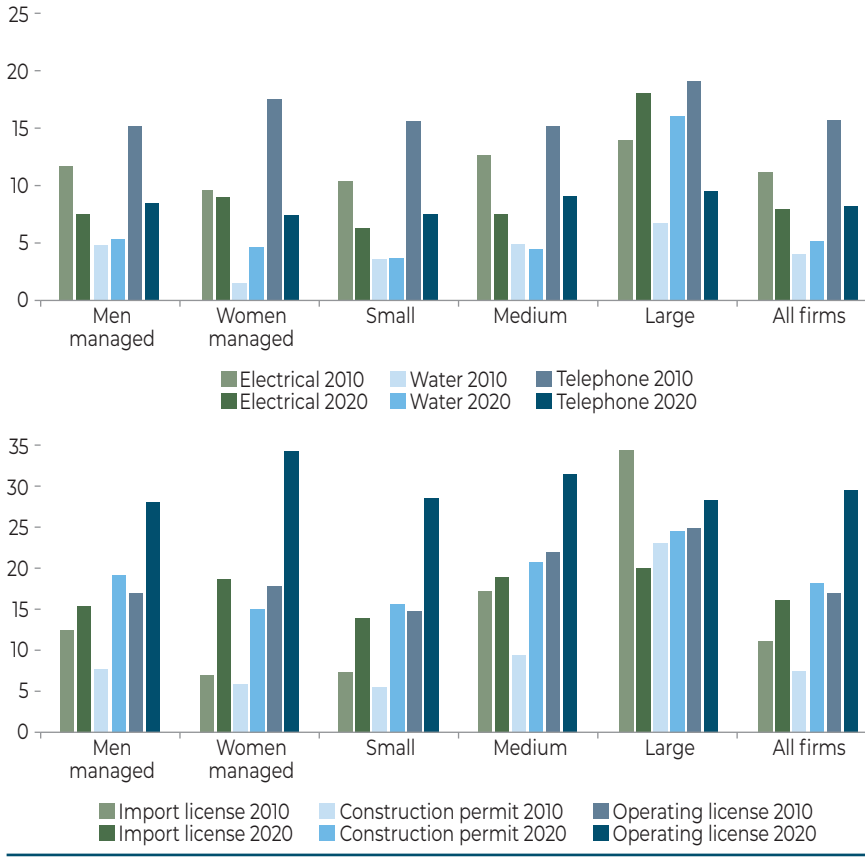
3.3. Differences over Time

The IFPG Survey makes it possible to incorporate the time dimension into the metrics that have been analyzed so far because it includes a subset of questions that were part of the 2010 WBES and/or the 2014 PROTEqIN Survey. This section focuses on the 2010–2020 comparison because one of the main objectives of this book is to provide an update on outstanding issues that were raised by Ruprah, Melgarejo, and Sierra (2014). Hence, the aim here is to focus on this chapter's relevant indicators and present them in a comparison over time by treating WBES and IFPG as two repeated cross-sections.

One important distinction in the analysis is the gender variable used. While the previous sections focused on women- or men-*owned* enterprises, that variable is now adjusted to focus on women- or men-*managed* firms. While the IFPG Survey provides information about the gender composition of the owners/shareholders of firms, the WBES questionnaire in 2010 only inquired whether there were any women among the owners of the firm, without providing enough information about the real gender composition of the firms' ownership. The WBES only provides information about the gender of the top manager, and this can be compared with the same information collected in 2020 by the IFPG initiative.

As discussed above, Caribbean firms did not often request an electrical, water or telephone connection in 2020 (Figure 3.4). This result holds when using 2010 WBES data. Figure 3.9 presents the share of firms that requested these services in both survey years. Requests for electricity and telephone connections were relatively lower in 2020, while the share of firms requesting water connections increased from 4.1 to 5.2 percent, on average. This could be the result of infrastructure improvements that had a positive

Figure 3.9. Requests for Connections in the Caribbean, 2010 and 2020 (Percent)



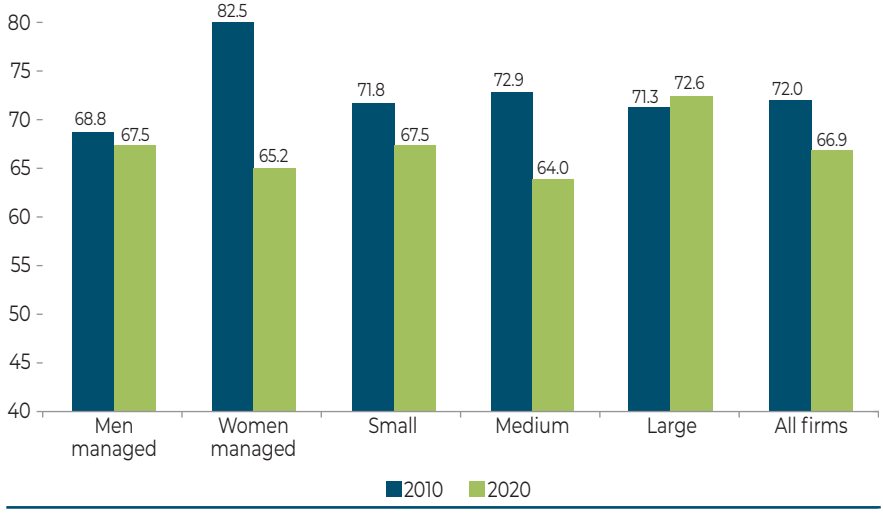
Source: Prepared by the authors based on the datasets of the 2010 World Bank Enterprise Surveys and the 2020 Innovation, Firm Performance, and Gender Survey.

effect on coverage/access during that decade.[9] The reduction in requests for electricity and telephone connections occurred across the board, with the exception of electricity requests by large firms, whose share of requests increased from 14 to 18.2 percent.

As in 2010, applications for import and operating licenses were more common than applications for construction-related permits in 2020. Moreover, the share of firms applying for these types of permits grew significantly

[9] Country-level data on access to electricity (percent of population) confirm this. The Caribbean average for 2010 was 94.2 percent, compared to 98.5 percent in 2020. The only countries for which access had not reached 100 percent in 2020 were Suriname (98.2 percent), Belize (97.1 percent), Grenada (93.5 percent), and Guyana (92.5 percent).

Figure 3.10. Power Outages in the Caribbean, 2010 and 2020 (Percent)



Source: Prepared by the authors based on the datasets of the 2010 World Bank Enterprise Surveys and the 2020 Innovation, Firm Performance, and Gender Survey.

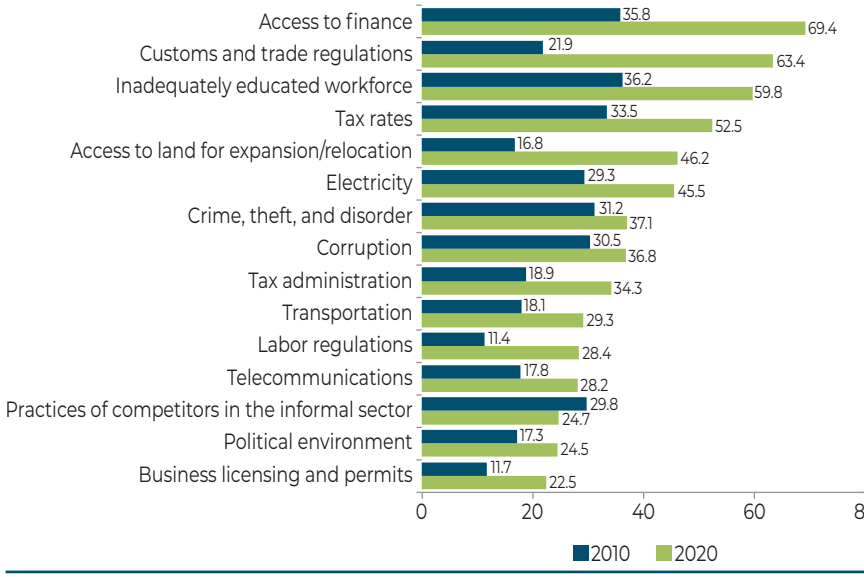
between 2010 and 2020, particularly for import licenses, for which applications increased from 11.3 to 16.2 percent of firms; construction permits, from 7.4 to 18.3 percent; and operating licenses, from 17.1 to 29.7 percent. The only application for which the proportion dropped was large firms applying for import licenses, which decreased from 34.5 percent in 2010 (highest among all groups) to 20.1 percent in 2020.

The reliability of the power supply in the Caribbean shows an improvement over time. The percentage of firms that experienced a power outage in 2010 was 72 percent, but this share fell to 67 percent by 2020, as shown in Figure 3.10. An encouraging result is that most of the overall improvement could be driven by women-managed firms. In addition, small and medium-sized firms fared relatively better than their large counterparts, which experienced a slight increase in power outages. While the percentage of firms that reported outages decreased, the total hours of power outages remained practically the same (6.8 hours in 2010 versus 6.9 hours in 2020), while the estimated losses as a percentage of annual sales doubled from 2010 to 2020 from 0.8 to 1.7 percent.[10]

The evolution of subjective perceptions about the obstacles faced by businesses could shed light about the progress (or lack thereof) of their

[10] While the 2020 IFPG Survey included data on outages/interruptions for mobile phone connections and Internet access, the 2010 WBES only focused on power outages.

Figure 3.11. Constraints to Business in the Caribbean, 2010 and 2020 (Percent)



Source: Prepared by the authors based on the datasets of the 2010 World Bank Enterprise Surveys and the 2020 Innovation, Firm Performance, and Gender Survey.

associated objective indicators. Figure 3.11 suggests that perceptions about business obstacles have deteriorated significantly over time. This could be the result of a worsening of the business environment or of a change during survey execution that saw more emphasis on the module including obstacles to business operations. In any case, the ordered ranking of perceived obstacles makes certain issues clear. First, access to finance has consistently been reported as a major obstacle (ranked first in 2020 and second in 2010). The same holds true for an inadequately educated workforce (ranked first in 2010 and third in 2020) and for tax rates. The only constraint for which the proportion of firms reporting it as binding decreased over time was the practices of competitors in the informal sector (Figure 3.11).

The persistent negative opinions about an inadequate workforce and access to finance will be discussed in Chapters 4 and 6, respectively. This persistence could point to unresolved issues that have not yet been addressed by policy actions that could improve the perception of business owners based on objective results. Ruprah and Sierra (2016) already discussed the obstacles facing the Caribbean relative to those facing other small economies. They also provided evidence about the existing correlations between subjective and objective measurements related to some of these obstacles. Furthermore, empirical evidence has shown that inadequate access to

finance impairs firm productivity (De Mel, McKenzie, and Woodruff 2008). Hence, the call for policy action with respect to the most pressing obstacles remains of the utmost importance, but is as yet unheard.

3.4. Conclusions and Policy Implications

The literature on business environments suggests that there are two main factors that explain per capita growth rates across countries: capital accumulation (investment) and TFP. The evolution of private investment in the Caribbean has been similar to the average for Latin America, with values fluctuating from 20 to 28 percent of GDP. However, Fajnzylber, Guasch, and Lopez (2008) showed the region's underperformance in a global context. The only region with lower investment rates than Latin America and the Caribbean was sub-Saharan Africa, which also averaged around 20 percent of GDP in the early 2000s. Regarding TFP, this chapter presented its evolution for the three Caribbean countries with existing data and showed how only Trinidad and Tobago has performed relatively better than the regional benchmark.

This chapter complemented the country-level analysis by providing firm-level evidence related to the business environment in the Caribbean using IFPG Survey data. There were fewer requests for basic utility connections than for licensing (import, construction, or operating) or permits. Furthermore, a substantial number of bribes to obtain these permits were reported. For example, 31 percent of firms that applied for an import license had to make informal payments or gifts to get them. These informal payments affect smaller firms disproportionately. Approximately 31 percent of small and medium-sized firms had to make informal payments to obtain a construction-related permit, compared to 19 percent of large firms.

After overcoming the hurdles to obtain basic utility services, Caribbean firms have to endure the relatively low quality of those services. Service outages in the Caribbean are considerable, especially for power and Internet access, with 67 and 58 percent of firms having experienced an outage, respectively. Firms that experienced any outage or service interruption in the Caribbean lost, on average, 2.2 percent of their total annual sales. Finally, although the share of firms that experienced a power outage decreased from 72 percent in 2010 to 67 percent by 2020, the total hours of power outages remained unchanged, and the estimated losses doubled from 2010 to 2020.

The evidence presented in this chapter points to the need to implement policies for a business-enabling environment in order to foster economic growth by boosting firm performance in the Caribbean. Indeed, the few

Caribbean firms that operate within a favorable business environment are significantly more productive. Therefore, streamlining the process to obtain licenses and permits by reducing paperwork and wait times would have a positive impact on firm performance and encourage entrepreneurship. Although digitalization offers appropriate tools to streamline permitting processes, there are challenges for the implementation of these policies such as bureaucratic inertia and a preference for existing procedures within government agencies, inadequate funding or human resources to implement new streamlined processes effectively, and the need for skilled personnel to design and implement efficient digital permitting systems.

The associated higher costs imposed by informal payments must be prevented by implementing nationwide campaigns to promote transparency and report corruption (telephone hotlines) by service utility providers and government officials in charge of granting licenses and permits. Nonetheless, the implementation of anti-corruption initiatives also faces significant challenges like the resistance from those who benefit from the current system of informal payments. Also, the Caribbean has weak enforcement mechanisms with inadequate legal frameworks or enforcement capacity to hold corrupt officials accountable (Beuermann and Schwartz 2018). There can also be fear of retribution with concerns among businesses about potential retaliation for reporting corruption.

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4

Skills and Employability: The Dire Need to Improve Human Capital in the Caribbean

Diether W. Beuermann and Ricardo Sierra

An appropriately skilled and well-educated labor force is essential for productivity growth, business development, and overall economic growth. Productivity is enhanced when skilled individuals perform tasks more efficiently and effectively, which leads to higher-quality outputs, reduced waste, and improved processes that ultimately boost a firm's productivity levels. Moreover, skilled individuals can think critically, solve complex problems, and generate creative ideas that can permeate the rest of the organization. These individuals are more likely to contribute to organizational success, improve the work environment, and indirectly push management to attract and retain top talent.

Despite these various channels through which skilled individuals can foster productivity and growth, the Caribbean has fallen short of either producing or retaining a critical mass of skilled workers in its workforces. This chapter explores some of the reasons for that.

Ruprah, Melgarejo, and Sierra (2014) provide evidence for the relative decline of Caribbean economic growth with respect to other small economies in terms of (i) the number of working people relative to the total population, (ii) a lower use of capital per unit of labor, and (iii) inferior technological progress measured by total factor productivity (TFP). The authors note the Caribbean's relatively small population and point to net emigration rates as the main factor behind declining growth. Migration and its decomposition by skill levels will be analyzed in this chapter to better understand the stock and flows of skilled persons and investigate the Caribbean "brain drain" hypothesis.

Besides providing country-level data on skills and economic growth, migration, educational achievement, and other relevant topics, this chapter includes an analysis of firm-level data from the 2020 Innovation, Firm Performance, and Gender (IFPG) Survey.[1] The survey found that an inadequately

[1] See Compete Caribbean, https://www.competecaribbean.org/proteqin-ifpg-datasets/.

educated workforce is widely perceived within the Caribbean as a major obstacle for the operations of firms. The only other issues of comparable scope are customs and trade regulations, and access to finance (to be covered in Chapter 6). The analysis presented in this chapter will focus on the relevance of skills and its relationship to economic growth, the existing skill mismatch in the Caribbean, and the outlook for the region's labor force in terms of current in-demand occupations and the emerging skills that the region needs.

4.1. Do Skills Really Matter?

The development of skills is crucial for economic growth in the current worldwide setting in which technology is evolving at a very fast pace. Since the beginning of the past decade, this evolving technology has changed the way people work and the skill sets required for them to be successful at their jobs. It has broadened opportunities for new investments and inherently increased productivity and job creation among firms that have been able to adopt and adapt new technologies. At the same time, however, this changing technological environment has created unprecedented pressure for the supply of skills. Countries must ensure that they have a proper education system (and vocational training) that provides the newly needed skills in order to foster job creation, productivity enhancement, and, ultimately, economic growth. If there is an existing mismatch between the supply of and demand for new skills, these prospects vanish, and the lack of productivity gains can endanger the international competitiveness of domestic firms.

Furthermore, the skill mismatch problem cannot be solved only by providing the necessary skill set early in a person's preparation for the labor force. With the ever-changing technological scenario, jobs are changing rapidly as well. Therefore, countries must ensure proper access to education (see the discussion below on the importance of the quantity and quality of education), affordability of information and communications technology services, and opportunities for lifelong learning (education and training systems) inside and outside the workplace (Aggarwal 2020).

Evidence of the relation between education quality and measures of economic returns (i.e., labor market participation, earnings, and productivity) is analyzed here for developed countries using the Survey of Adult Skills administered to 166,000 adults from 22 Organisation for Economic and Co-operation and Development (OECD) member countries.[2] The results sug-

[2] This survey was part of the Programme for the International Assessment of Adult Competencies and focused on skills—literacy, numeracy, and problem-solving—similar to those commonly assessed by the Programme for International Student Assessment.

gest that proficiency in literacy, numeracy, and problem-solving is positively associated with the probability of participating in the labor market, being employed, and earning higher wages. An increase of one standard deviation in a person's literacy proficiency (46 score points) is associated with a 20 percent increase in the probability of participating in the labor market and a 10 percent increase in the probability of being employed as opposed to being unemployed (Desjardins et al. 2013). In addition, persons with lower levels of proficiency are more likely to report poor health or believe that they have no impact on the political process. Finally, lower proficiency reduces the likelihood of participating in volunteer activities and is associated with lower levels of trust in others. These issues point to a broader set of desirable social outcomes that are related to skills and that could also have major economic effects in developing countries.

The importance of skills in the labor market and for other socioeconomic indicators for developed countries is undeniable and well documented in the OECD's 2013 Skills Outlook (Desjardins et al. 2013). The key message from that report is that what people know and what they do with what they know has a major impact on their life chances. The impact of skills has proven to go beyond employment status and wages—that is, other desirable social well-being indicators are enhanced by the acquisition of literacy, numeracy, and problem-solving skills.

The association between skills and productivity/employment has been discussed in many empirical studies since the 1960s. Fields (1980) was part of an expert group in charge of a seminal review by the World Bank on education and income. His chapter focused on education and income distribution in developing countries and presented an exhaustive review of the existing literature at the time. That comprehensive review led to the following conclusions: (i) better-educated workers have lower unemployment rates, tend to be employed in superior occupations, and tend to earn higher incomes in developing countries; (ii) given the same measured education and skills, men earn more than women in most (if not all) developing countries; (iii) educational opportunities differ among heterogeneous groups (gender, race, geographic location, and parents' socioeconomic status) in developing countries, and this is an important cause of income inequality; (iv) there are social benefits of education (higher national income, lower incidence of poverty), but causality issues are not resolved (or had not yet been at the time of the report); and (v) the distribution of the benefits from education in developing countries appears to be highly inequitable in terms of equal opportunity.

Gallart (2008) conducted a more specific study on skills in Latin America and the Caribbean to illustrate the relationship between training and worker

skills, productivity, and quality employment in the region.[3] The author analyzed existing information on these topics and undertook a deeper analysis of national case studies. While the case studies did not include a Caribbean country, they shed light on the existing situation in the region. One key finding was that high levels of inequality and poverty incidence prevent a large proportion of the population from acquiring the basic skills provided by formal education. More recently, Beuermann and Jackson (2022) and Beuermann et al. (2023, 2024) provided direct evidence of a causal long-run link between educational attainment, adult well-being, and labor market success in Barbados and Trinidad and Tobago.

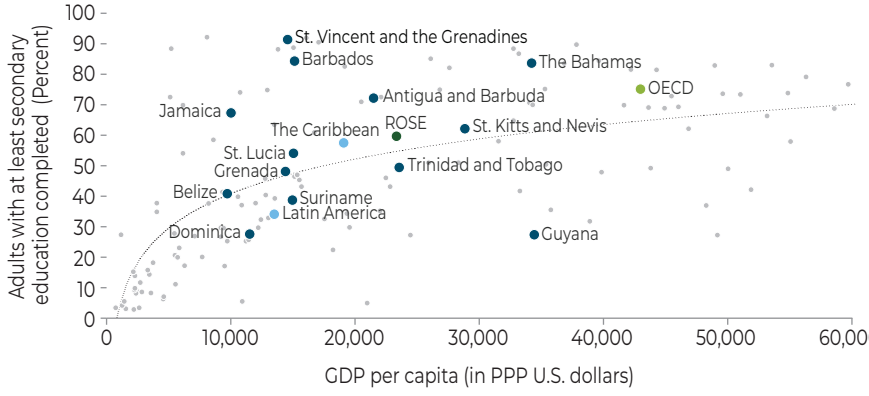
With the above context in mind, this chapter will examine the relationship between economic development and education (quantity and quality) in order to assess whether the Caribbean has been able to translate the positive effects of education (developing human capital, knowledge, skills, and abilities) into economic growth. This relationship could be direct or indirect. Better-educated individuals are more employable, which allows them to take higher-value-added jobs that spur GDP output and improve living standards (direct). But education also produces positive externalities such as improving knowledge, promoting innovation, creating new businesses, and fostering entrepreneurship (indirect).

Figure 4.1 shows the relationship between the share of the adult population (25+ years of age) with at least secondary education completed and GDP per capita. The Caribbean on average has a higher share of individuals with secondary education or above (54 percent) than the rest of Latin America (34 percent). This differential (20 percentage points) places the Caribbean above the expected educational attainment for its level of GDP per capita (dotted line in the figure). However, Caribbean countries such as Dominica and Guyana have lower-than-expected educational outcomes. The case of Guyana is notorious because it has high GDP per capita (similar to The Bahamas) but its share of adults with at least secondary education is significantly below what would be expected given its income level.

Overall, Figure 4.1 places the Caribbean in relatively good standing with regard to the average educational attainment of its population given its level of GDP per capita. There is room for improvement in some countries, but the overall picture for the countries studied throughout this book is positive. People who have gone through the formal education system and completed at least secondary school acquire skills that can be applied later in

[3] Skills are defined as the stock of knowledge, abilities, and attitudes needed for the world of work, while the productivity measure used in this study is annual GDP per employed person.

Figure 4.1. Educational Attainment and Economic Development



Source: Prepared by the authors based on World Bank Education Statistics (EdStats) and the following sources: Antigua and Barbuda: 2018 Labor Force Survey; Belize: 2022 Labor Force Survey; Dominica: 1999 Labor Force Survey; Grenada: 2015 Labor Force Survey; St. Kitts and Nevis: CPA 2008 Report; St. Lucia: https://stats.gov.lc/subjects/society/labour; St. Vincent and the Grenadines: UNESCO Sustainable Development Goal data.
Note: OECD: Organisation for Economic Co-operation and Development. ROSE: rest of the small economies of the world. PPP: purchasing power parity. The dotted line represents a nonlinear fit of the datapoints.

their jobs. This skill acquisition improves their chances of getting a better job, which in turn could lead to improvements in their well-being. However, the acquired skills depend not only on attending school and graduating from secondary or tertiary education, but also on the quality of this education. It has been shown that the expansion of school attainment has not always guaranteed improved economic conditions. Hanushek and Woessman (2012) review the role of education in promoting economic well-being by focusing on the role of educational quality. The authors find strong evidence that the cognitive skills of the population—rather than school attainment—are strongly related to individual earnings, income distribution, and economic growth. Also, international comparisons using cognitive skills reveal larger skill deficits in developing countries than those revealed by the typical educational metrics such as enrollment and attainment. This points to the need for a policy agenda aimed at closing the economic gap with respect to industrial countries by making structural changes in developing countries' schooling institutions.

Unfortunately, the only Caribbean country that has participated in the Programme for International Student Assessment (PISA) is Trinidad and Tobago, which participated in the 2009 and 2015 rounds.[4] Historically,

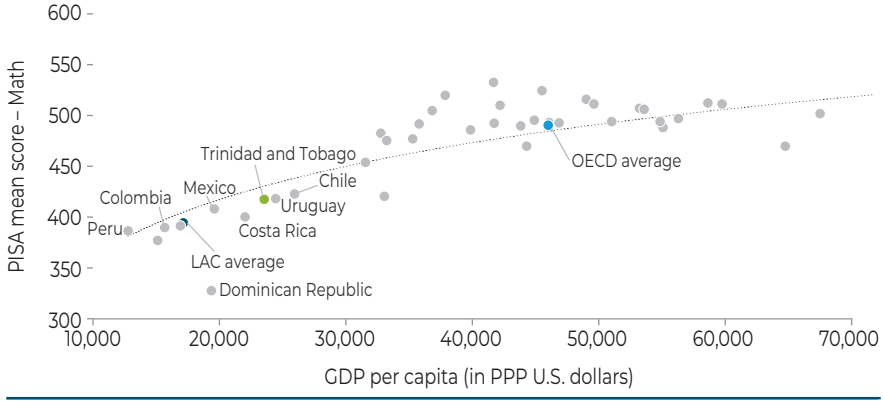
[4] Jamaica participated in the 2022 PISA round. However, disaggregated data were not yet available at the time of this writing.

countries from Latin America and the Caribbean have performed relatively worse than OECD countries. Most of the PISA results showcase a learning crisis in the region. For example, the 2015 PISA results showed that, on average, 15-year-old students from Latin America and the Caribbean were three years behind (in reading, mathematics, and science) the typical student in an OECD country. Moreover, half of the students in Latin America and the Caribbean did not reach the basic reading proficiency level required in the PISA, compared to only 20 percent in OECD countries.

Figure 4.2 shows the relationship between the 2015 PISA average math score and GDP per capita (in 2017 purchasing power parity [PPP] U.S. dollars). The positive relationship that was observed for educational attainment still holds. Trinidad and Tobago's average score (417 points) is relatively higher than the Latin American and Caribbean average (394 points), but still lower than what would be expected for a country with its level of GDP per capita. The OECD average score is significantly higher at 490 points. Taking into consideration that 30 points are equivalent to one year of schooling, it is clear that the region lags behind in terms of educational quality (equivalent to almost three less years of schooling in 2015).

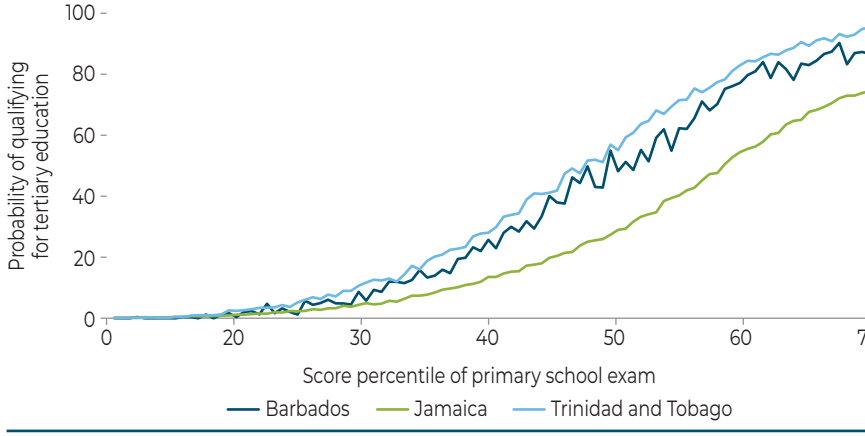
These findings are confirmed by the examinations carried out by the Caribbean Examinations Council (CXC). Newly assembled administrative data covering the full population of Barbados, Jamaica, and Trinidad and Tobago reveal that, overall, only an average of 65 percent of students who completed primary school qualify for tertiary education based on the

Figure 4.2. Educational Quality and Economic Development



Source: Prepared by the authors based on PISA scores and the World Bank's World Development Indicators (GDP per capita in purchasing power parity – PPP).
Note: Programme for International Student Assessment (PISA) scores correspond to the 2015 round. GDP data correspond to the same year as the PISA scores. LAC: Latin America and the Caribbean. OECD: Organisation for Economic Co-operation and Development. The dotted line represents a non-linear fit of the datapoints.

Figure 4.3. Likelihood of Qualifying for Tertiary Education by Primary Exam Score (Percent)



Source: IDB Caribbean Country Department calculations using matched 2004–2012 SEA exams for Trinidad and Tobago, 2004–2018 GSAT exams for Jamaica, and 2004–2011 BSSEE exams for Barbados with CSEC databases.

Caribbean Secondary Examination Certificate (CSEC) administered by the CXC.[5] This aggregate statistic also masks important heterogeneities suggesting that learning inequalities are maintained over time. Figure 4.3 shows that students who finished primary school below the 40th percentile of the national achievement distribution have virtually no chance of qualifying for tertiary education at the end of secondary school.

Overall, the evidence shows that Caribbean countries fare relatively well in terms of educational quantity (attainment). They are mostly above the predicted line that represents the relationship between GDP per capita and the adult population with at least secondary school education. This is positive in the sense that formal education provides basic skills that can then be a proxy for better employment opportunities, higher wages, and overall well-being. However, when focusing on learning outcomes (i.e., educational quality), the Caribbean performs relatively poorly given its level of GDP per capita. This clearly represents what Hanushek and Woessman (2012) defined as the Latin American "growth puzzle": the region has trailed

[5] CSEC qualification for tertiary education requires passing at least five subjects, including the core subjects of English and mathematics. This qualification was reached by 68 percent of students in Barbados, 56 percent in Jamaica, and 72 percent in Trinidad and Tobago. Source: IDB Caribbean Country Department calculations using the matched end of primary national examinations (the 2004–2012 SEA for Trinidad and Tobago, 2004–2018 GSAT for Jamaica, and 2004–2011 BSSEE for Barbados) with CSEC databases.

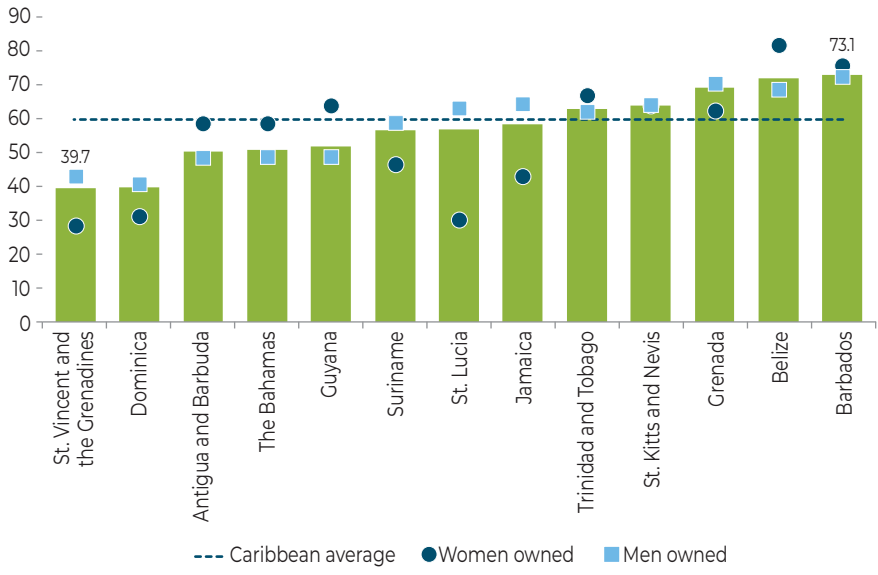
most other regions over the past century despite relatively high initial development and school attainment levels. In other words, the skills of students remain relatively low, and given the region's educational achievement measures, school attainment per se does not have a significant relationship with long-term growth.

4.2. Is There a Skill Mismatch?

As detailed in Chapter 3, the lack of an adequately educated workforce ranks third among the 17 obstacles to business operations that were included in the IFPG Survey. Furthermore, when comparing the same set of obstacles over time, the perception about the workforce worsened significantly between 2010 and 2020: 36.2 percent of Caribbean firms found this to be a major obstacle for their operations in 2010, compared to 59.7 percent in 2020. This finding, however, masks heterogeneous results across countries, ranging from 40 percent for St. Vincent and the Grenadines to 73.1 percent for Barbados.

Figure 4.4 shows the country heterogeneity but also incorporates the gender dimension in the analysis. The gender disparities are not uniformly leaning toward a particular end of the spectrum. While 30 percent of

Figure 4.4. Perception of an Inadequately Educated Workforce as a Constraint in the Caribbean (Percent)



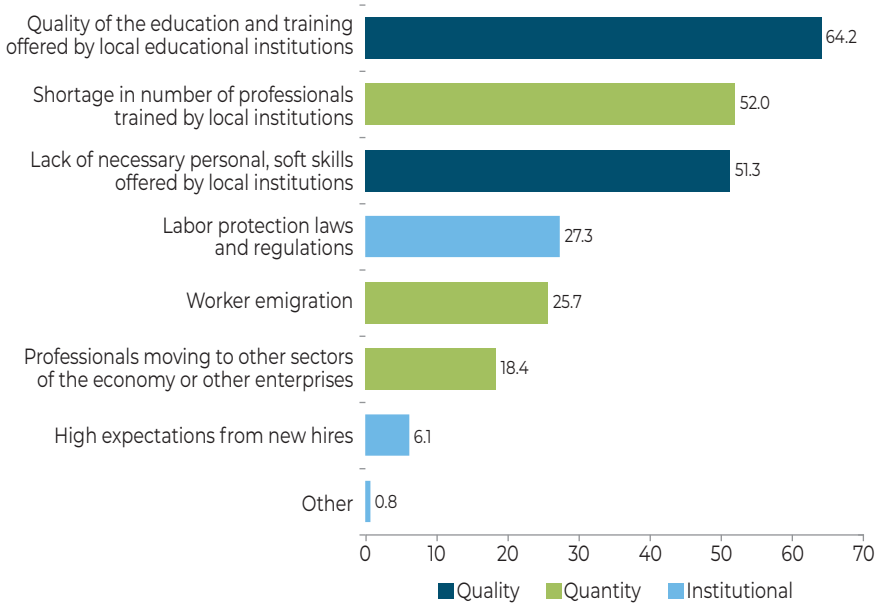
Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

women-owned firms perceive education as a major constraint in St. Lucia, this proportion is 63.3 percent among men-owned firms there. In contrast, almost two-thirds of women-owned firms in Guyana have a negative perception of the education of the workforce, compared to 48 percent of men-owned firms.

While based on subjective valuations by firm managers, this simple country-level analysis suggests that there is a prevalent concern among Caribbean businesspersons about an inadequately educated workforce. This chapter has already shown how educational attainment in the Caribbean is relatively well positioned, but it has also provided evidence about poor student performance on learning outcomes. If the underperformance in learning outcomes persists throughout tertiary education and is not overcome by technical proficiency, the supply of skilled labor will not be enough to fulfill employers' needs. This could be classified as a problem of *quality*, where the education and training offered by local institutions in a given country provides little value-added for employers, thus producing a mismatch between education and industry needs. To tackle this curricula misalignment, educational institutions should proactively update their curricula to keep pace with the changing requirements of different industries so that graduates acquire the specific skill set or practical experience needed by employers. If these institutions engage actively with industries to understand market needs, the disconnect between what is taught and what is required in the labor market will be ameliorated.

On the other hand, the problem could reflect a scenario where there are not enough skilled professionals available to meet the demands of the job market (*quantity*). This could be exacerbated by supply-side negative shocks in the form of emigration of high-skilled individuals out of the Caribbean or sector movements within the country. Since the skill problem has been persistent in the Caribbean, the IFPG Survey included a question about the importance managers assign to different potential causes of skill shortages. The question assigned a subjective ranking of the importance of each cause, ranging from "not important – 1" to "critical – 5." Hence, the proportion of firms that rated each potential cause at these levels of importance is calculated here in order to assess the severity of each cause. Finally, the potential causes were classified as relating to quality, quantity, or being of an institutional nature. Figure 4.5 shows how a larger proportion of managers perceive causes related to quality as more important than other potential causes. Indeed, 64.2 percent of Caribbean firms believe the quality of the education and training offered by local educational institutions is a very important cause of the skill shortage problem. This is followed by a typical quantity cause: 52 percent of managers reported a shortage in the number of professionals trained by local institutions.

Figure 4.5. Perceived Sources of Skill Shortages in the Caribbean (Percent)



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

The human resource management section of the IFPG Survey provides a complete characterization of a firm's workforce.[6] Exploiting that characterization allows for calculating the shares of skilled, unskilled, and management personnel in each firm of the sample. When focusing on full-time permanent employees, the average proportion of skilled, unskilled, and management workers in the Caribbean is 47.5 percent, 31 percent, and 21.5 percent, respectively. Table 4.1 shows the calculated proportions for each country and aggregates industrial sectors into (i) manufacturing, mining, and quarrying; (ii) tourism-related services; and (iii) other services. The sector with the highest average proportion of skilled workers is manufacturing, mining, and quarrying, with just above 50 percent. However, in Suriname and Barbados the proportion of skilled workers in these industries reaches 58.1 percent and 57.2 percent, respectively. The tourism sector deviates from the average—which is closer to what is observed in other

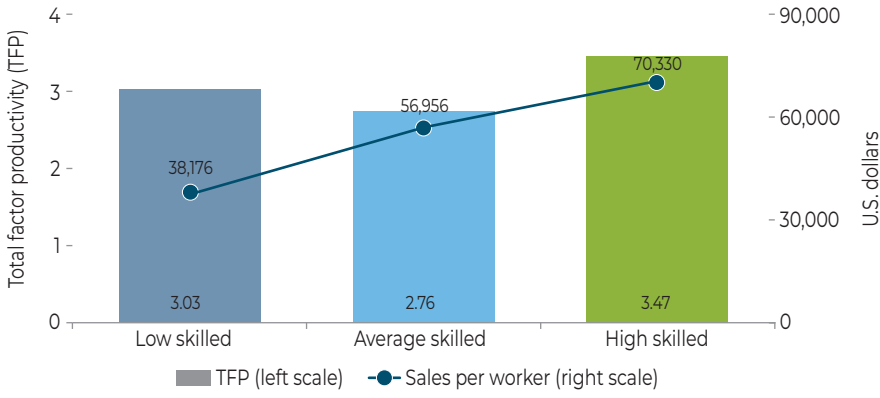
[6] The survey section includes information about the total number of workers and their average annual wages, and the breakdown of the workforce composition between management and skilled and unskilled production (and non-production) workers. The data are available for full-time permanent workers, full-time seasonal/temporary workers, and part-time workers.

Table 4.1. Characterization of Full-Time Permanent Workers in the Caribbean (Percent)

	Skilled Workers				Unskilled Workers				Management			
	Overall (all sectors)	Manuf., mining & quarrying	Tourism services	Other services	Overall (all sectors)	Manuf., mining & quarrying	Tourism services	Other services	Overall (all sectors)	Manuf., mining & quarrying	Tourism services	Other services
Antigua and Barbuda	**44.9**	36.5	44.0	46.4	**29.7**	41.0	29.4	28.3	**25.4**	22.4	26.7	25.3
The Bahamas	**47.2**	47.9	44.5	47.7	**23.8**	23.4	24.6	23.7	**29.0**	28.7	30.9	28.6
Barbados	**33.8**	57.2	23.5	33.0	**55.1**	29.9	65.2	56.6	**11.0**	13.0	11.3	10.4
Belize	**50.7**	45.0	54.6	48.5	**27.7**	36.5	22.5	30.2	**21.6**	18.5	22.9	21.3
Dominica	**47.2**	53.7	45.5	46.8	**27.0**	28.3	28.5	26.3	**25.8**	18.0	26.0	27.0
Grenada	**53.5**	53.3	54.3	53.3	**25.4**	26.4	25.0	25.4	**21.1**	20.2	20.7	21.3
Guyana	**50.9**	47.9	52.9	51.8	**27.3**	29.9	30.1	25.5	**21.8**	22.3	17.0	22.8
Jamaica	**44.9**	48.9	25.9	44.3	**32.7**	25.5	51.6	34.7	**22.4**	25.6	22.5	21.0
St. Kitts and Nevis	**51.9**	51.8	54.0	51.6	**26.6**	26.6	25.2	26.9	**21.5**	21.6	20.8	21.6
St. Lucia	**50.0**	54.9	46.1	51.1	**23.1**	24.0	24.5	22.1	**26.9**	21.1	29.4	26.8
St. Vincent and the Grenadines	**47.5**	46.7	51.5	46.4	**26.5**	25.0	19.8	28.8	**26.1**	28.3	28.7	24.8
Suriname	**56.5**	58.1	54.6	56.3	**24.6**	20.2	30.1	25.2	**18.9**	21.7	15.4	18.5
Trinidad and Tobago	**51.3**	49.4	54.9	51.6	**27.9**	31.4	26.2	27.1	**20.8**	19.2	18.9	21.2
Caribbean average	**47.5**	**50.3**	**43.4**	**47.8**	**31.0**	**28.9**	**34.6**	**30.6**	**21.5**	**20.8**	**22.0**	**21.6**

Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

Figure 4.6. Skills and Firm Performance in the Caribbean



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

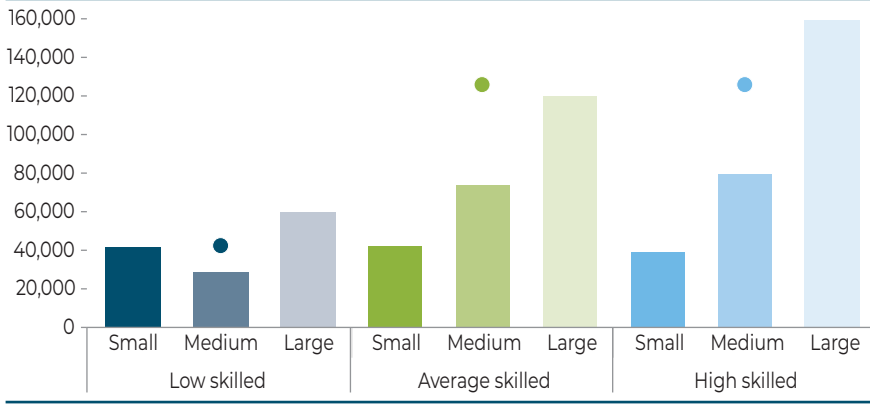
services—in the sense that it has a relatively lower share of skilled workers and a higher proportion of management employees, which is expected. In particular, The Bahamas, which is heavily dependent on tourism, has a lower-than-average share of unskilled workers, which is offset by having the highest proportion of management personnel (29 percent). By contrast, Barbados' low proportion of skilled workers is offset by having the highest share of unskilled workers (55.1 percent) and a relatively low share of management workers (11 percent).

To further test the relationship between the proportion of skilled workers and firm productivity, the proportion of skilled workers presented above can be coded as a categorical variable that classifies firms into low skilled (proportion of skilled workers below $\mu - \sigma$), average (skilled proportion between $\mu - \sigma$ and $\mu + \sigma$), and high skilled (proportion above $\mu + \sigma$).[7] Due to the high concentration of firms around the mean, the dispersion of firms according to this classification into low-skilled, average, and high-skilled firms is 12.3, 77.3, and 10.2 percent, respectively.

Figure 4.6 shows how labor productivity increases with the higher proportions of high-skilled employees. Average sales per worker in the Caribbean is US$55,940. However, firms classified as mainly low-skilled according to the above definition have significantly lower average productivity (US$38,176). Average-skilled firms have average productivity slightly above the Caribbean average, and those firms with the highest concentrations of skilled workers have average sales per worker of US$70,330. The

[7] Notice that μ denotes the mean of the distribution, while σ denotes the standard deviation.

Figure 4.7. Skills and Performance by Firm Size in the Caribbean (U.S. dollars per worker)



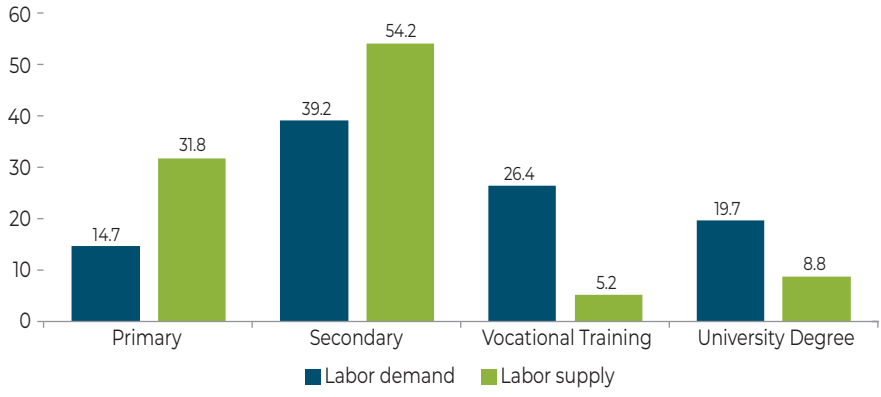
Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.
Note: The dots in the figure represent the average for each skill group, regardless of size.

differences with respect to TFP are not so striking. While high-skilled firms have the highest TFP (3.47), average-skilled firms have a lower average TFP (2.76) than their low-skilled counterparts (3.03). TFP is a more general measure that encompasses all factors of production, rather than just labor. The TFP differences shown in Figure 4.6 could be driven by a better use of capital and intermediate goods in the production processes of Caribbean firms.

Table 4.1 and Figure 4.6 provide evidence of the benefits of employing a higher proportion of highly skilled individuals (quality). This is particularly true in the services sector, where average sales per worker in high-skilled firms is 2.2 times higher than in low-skilled firms. Furthermore, when analyzing firm size within each sector, large firms from the services sector (other than tourism) are the ones pulling the overall sales per worker metric. Figure 4.7 presents sales per worker information for the services sector in the Caribbean, disaggregating by average skill level and firm size. Labor productivity is US$42,377 for the average low-skilled firm (dark blue dot) and performance is not strictly increasing by size. But the pattern of growing productivity by firm size is clearly perceived in average and high-skilled firms.

The above evidence suggests a mismatch of skills between labor supply and demand in the Caribbean. Nonetheless, to provide direct evidence of this, both the supply of and demand for skills in the labor market need to be objectively characterized. To this end, firm-level data from the 2014 Productivity, Technology, and Innovation (PROTEqIN) Survey is used because it

Figure 4.8. Labor Supply and Demand by Educational Level in the Caribbean (Percent)



Source: Prepared by the authors based on the datasets of the 2014 Productivity, Technology, and Innovation Survey for labor demand and the Suriname 2022 Survey of Living Conditions and 2013 Labor Force Surveys of The Bahamas, Barbados, Jamaica, and Trinidad and Tobago for labor supply.

provides information on the distribution of minimum educational levels that firms require when hiring workers (labor demand).[8] This labor demand is represented by the firms' required level of education for both filled positions and the vacancies for all different job types.[9] The distribution of the workforce by educational levels is quantified using micro-level data from labor force and living conditions surveys (labor supply).

The resulting distributions of both labor supply and demand, reported in Figure 4.8, show that there is an oversupply of workers with lower levels of education (primary and secondary) and an undersupply of workers with tertiary education (vocational training and university degrees). While 15 percent of positions in the Caribbean private sector demand workers with primary education (mostly driven by the demand for craft and related trade workers and elementary occupations), about 32 percent of the Caribbean labor force has primary education as its highest educational attainment. A similar pattern of excess supply arises for secondary-educated individuals. However, workers with tertiary education are in low supply. The labor market demand for persons with either vocational training or a university

[8] For information on the PROTEqIN Survey, see the Compete Caribbean website at https://www.competecaribbean.org/proteqin-ifpg-datasets/.

[9] Job types included in the survey were managers, professionals, technicians and associate professionals, clerical support workers, service and sales workers, skilled agricultural, forestry, and fishery workers, craft and related trade workers, plant and machine operators, and elementary occupations.

degree reaches 46 percent, strongly exceeding the 14 percent of the labor force that meets this educational attainment level.

4.3. To What Extent Does Emigration Contribute to the Skill Shortages?

To analyze the potential cause of a shortage in the number of professionals trained by local institutions, this section turns to country-level data on migration and educational attainment. Outward migration from Latin America and the Caribbean has been carefully analyzed for the past decades. Migrants from the region account for about 10 percent of the population and the remittances they send to support their families average 8 percent of GDP (IMF 2017).

The international migrant stock from Caribbean countries by 2020 reached 2.7 million individuals, representing 37 percent of the Caribbean's total population.[10] This share increased significantly from 1990, when Caribbean migrant stock represented 25 percent of the Caribbean population (Table 4.2). Migration from the rest of the region has also been constantly increasing since the 1990s and has more than doubled to reach a total of 42.8 million migrants by 2020. Table 4.2 provides evidence of the magnitude of outward migration from the region. This could translate into a reduction of real per capita economic growth as labor resources and productivity decrease in the home country. On the other hand, the remittances sent home by migrants are a mitigating factor, serving as a source of external financing for many households.

The in-depth analysis in the 2017 Regional Economic Outlook: Latin America and the Caribbean published by the International Monetary Fund (IMF) indicates that the negative impact of emigration on real per capita growth outweighs growth gains from remittances, especially for the Caribbean (IMF 2017). Remittances act as macroeconomic stabilizers because they represent one major source of external finance, facilitate private consumption-smoothing, and boost financial sector soundness. But the net effect of migration and remittances on growth tends to be negative for the Caribbean, which has been characterized by brain drain and relatively small remittance receipts (IMF 2017).

After considering the magnitude of the increasing emigration from the Caribbean, this section now turns to characterizing the Caribbean

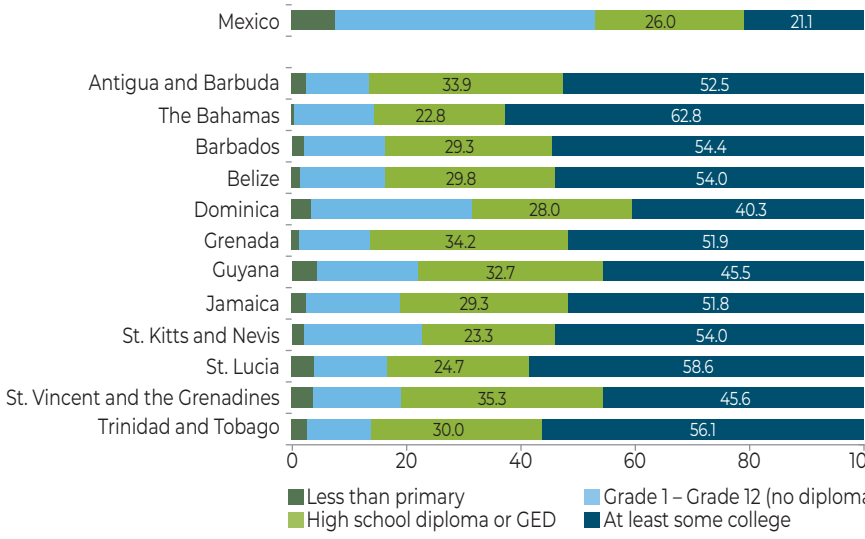
[10] For this analysis, the Caribbean includes the following 13 countries: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago.

Table 4.2. International Migrant Stock, 1990–2020

	1990	1995	2000	2005	2010	2015	2020
	Total population						
Latin America and the Caribbean	438,384,266	479,414,859	518,770,743	554,587,278	587,263,897	619,929,407	649,524,000
Caribbean countries	6,040,092	6,289,954	6,559,898	6,781,721	6,984,894	7,203,559	7,421,267
Caribbean/LAC	1.38%	1.31%	1.26%	1.22%	1.19%	1.16%	1.14%
	International migrant stock						
Latin America and the Caribbean	15,273,399	19,669,704	24,628,700	29,338,206	34,637,650	36,206,000	42,890,481
Caribbean countries	1,525,878	1,843,740	2,185,360	2,349,892	2,548,217	2,698,313	2,751,225
Caribbean/LAC	9.99%	9.37%	8.87%	8.01%	7.36%	7.45%	6.41%
Migrant stock/ population (Caribbean)	25.26%	29.31%	33.31%	34.65%	36.48%	37.46%	37.07%
Migrant stock/ population (Rest of Latin America)	3.18%	3.77%	4.38%	4.93%	5.53%	5.47%	6.25%

Source: Prepared by the authors based on international migrant stock data from the Population Division of the UN Department of Economic and Social Affairs.
Note: LAC: Latin America and the Caribbean.

Figure 4.9. Educational Attainment of Caribbean and Mexican Migrants in the United States (Percent)



Source: Prepared by the authors based on U.S. Census Bureau, American Community Survey.

migrant stock in terms of educational attainment. The UN Department of Economic and Social Affairs Population Division database that is the source for Table 4.2 also contains information on the region, development group, country, or area of destination for all migrant populations in five-year increments from 1990 to 2020. With this information, it can be corroborated that the most common destinations among Caribbean migrants are the United States and the United Kingdom. These two destinations alone received over 60 percent of the 2020 migrant stock from most Caribbean countries.[11]

Figure 4.9 uses the U.S. Census Bureau's American Community Survey to analyze educational attainment of Caribbean migrants that were living in the United States in 2018. The figure shows that over 50 percent of Caribbean migrants in the United States have at least some college education, except for those migrating from St. Vincent and the Grenadines (45.6 percent), Guyana (45.5 percent), and Dominica (40.3 percent). To put these figures in context, they are compared with data from the 2011 censuses of Jamaica and Trinidad and Tobago. Only 8 percent of Jamaicans over age 25 and 19 percent of Trinidadians reported having post-secondary education, com-

[11] The exceptions are Suriname, Dominica, and St. Vincent and the Grenadines. Most migrants from Suriname choose the Netherlands as their destination, while emigration from Dominica and St. Vincent and the Grenadines is mostly intra-regional (within the Caribbean).

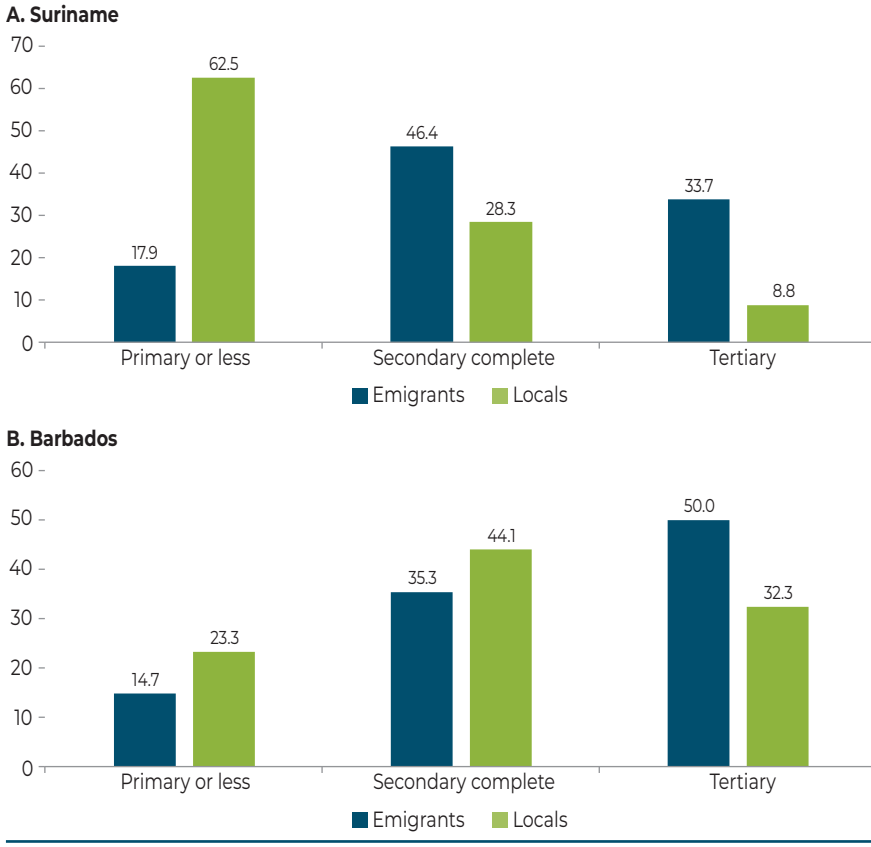
pared to 51.8 percent and 56.1 percent, respectively, of persons from those countries living in the United States. These figures also contrast with those reported for Mexicans, the largest migrant population in the United States. Only 21.1 percent of Mexicans living in the United States have at least some college education, while the average for U.S. migrants from the Caribbean countries analyzed is 52.3 percent.

The results presented in Table 4.2 and Figure 4.9 show that the migration dynamics in the Caribbean could lead to both types of shortages in the labor force. Not only do Caribbean people increasingly seek better opportunities abroad (quantity); there is indeed a Caribbean brain drain because most of the migrants are highly skilled (quality) in terms of educational attainment.

Another relevant reinforcing analysis directly compares the educational attainment distributions of both persons who emigrated and persons who did not. To this end, we use the surveys of living conditions in Suriname and Barbados that collected educational attainment information for both the local population and former members of the interviewed households who emigrated. Figure 4.10 shows that the emigrant population is significantly more educated than persons who did not emigrate. While only 18 percent and 15 percent of emigrants from Suriname and Barbados attained primary education or less, these figures are 63 percent and 23 percent of persons who stayed in Suriname and Barbados, respectively. The opposite is true for higher levels of educational attainment: 34 percent and 50 percent of emigrants from Suriname and Barbados have tertiary education, compared to only 9 percent and 32 percent of persons who did not emigrate.

Docquier and Marfouk (2005) and Mishra (2006) provide further evidence consistent with international migration being a significant determinant of the undersupply of a tertiary-educated workforce. The studies quantify international migration differentiated by educational level using censuses from OECD countries in 2000. Using these censuses, the authors accounted for the number of international Caribbean workers located in OECD countries and were able to calculate the share of the local Caribbean labor force that is working in those countries. Table 4.3 summarizes the findings. The evidence strongly demonstrates that migration is positively related to educational attainment. Indeed, the Caribbean average shows that while only 6 percent of primary-educated persons migrated, this figure increased to 34 percent for secondary-educated workers and jumped significantly to 68 percent for tertiary-educated workers. This constitutes one of the highest emigration rates in the world for skilled workers and is consistent with the documented undersupply of the tertiary educated workforce in the Caribbean.

Figure 4.10. Educational Attainment by Emigration Status (Percent)



Source: Prepared by the authors based on the datasets of the 2017 Suriname Survey of Living Conditions and the 2016 Barbados Survey of Living Conditions.

Welfare calculations indicate that the costs associated with investments in the education of emigrants outweigh the benefits from remittances sent by international workers back to the Caribbean. Most Caribbean countries provide publicly funded primary and secondary education. Others, like Barbados, Jamaica and Trinidad and Tobago, also invest significant shares of public resources in tertiary education. The rationale for investing public funds in education follows from the future expected social returns to such investments. Education carries private returns reflected in higher productivity and earnings. However, public investments in education are made with the expectation that such increased productivity will boost country-level growth and welfare. If people who have benefited from public education emigrate, then there are no social returns to educational investments in the source country. Mishra (2006) showed that although the Caribbean region

Table 4.3. Emigration and Brain Drain in the Caribbean (Percent)

	Percentage of Workforce that Emigrated to OECD Countries by Education Level			Emigration Loss Plus Estimated Education Expenditure (Percent of GDP)	Remittances (Percent of GDP, average 1980–2012)
	Primary	Secondary	Tertiary		
Antigua and Barbuda	3	57	56	13.2	3.0
The Bahamas	2	10	58	4.4	n.a.
Barbados	10	24	61	18.5	2.3
Belize	4	54	62	6.8	4.7
Dominica	8	56	49	11.5	8.4
Grenada	7	61	75	11	11
Guyana	7	35	80	9.5	1.9
Haiti	2	27	79	9.0	10.1
Jamaica	5	29	78	20.4	7.4
St. Kitts and Nevis	8	31	65	9.7	6.9
St. Lucia	2	13	53	3.8	4.0
St. Vincent and the Grenadines	4	23	71	10.7	7.2
Suriname	18	44	90	7.8	0.5
Trinidad and Tobago	3	17	68	16.8	0.3
Average	6	34	68	10.9	5.2

Source: Prepared by the authors based on Docquier and Marfouk (2005) and Mishra (2006).
Note: n.a.: not available; OECD: Organisation for Economic Co-operation and Development.

is also the world's largest recipient of remittances, welfare calculations suggest that the losses from public investments in education due to high-skill emigration outweigh the benefits of remittances. The last two columns of Table 4.3 summarize these findings, showing that for the Caribbean average the emigration loss accounts for 10.9 percent of GDP, while incoming remittances account for 5.2 percent of GDP.

The high level of emigration of skilled persons is compatible with economic incentives related to an existing wage gap between equally educated workers of the same nationality working in their native country and abroad. Some rationale should exist for explaining the observed skill-biased emigration rates in the Caribbean. A natural candidate relates to possible differential schooling premiums between the Caribbean and abroad. Under this scenario, Caribbean educated workers prefer to emigrate because their real earnings are higher abroad than if they stayed in their original country. Alonso-Soto and Ñopo (2015) provide partial evidence supporting this hypothesis by comparing the schooling premiums of immigrants from different nationalities working in the United States who were surveyed in different censuses. From the Caribbean, Jamaica and Trinidad and Tobago were included. For these countries, the evidence suggests that the differential schooling premium for workers with secondary studies is negative, but it turns positive for workers with tertiary education.

4.4. Conclusions

The development of skills is crucial for economic growth in the current context of fast-paced technology adoption within labor markets. This context has modified the way many people work as well as the skills required for modern jobs. It has also created an unprecedented level of pressure to supply such skills. Economic growth prospects decrease when a market failure in terms of a skill mismatch prevails in a given country.

The evidence provided in this chapter is conclusive in highlighting two major shortcomings in the Caribbean. First, the skills that students acquire through the formal education system are relatively low when compared to other countries with similar levels of economic development. Although most Caribbean countries have acceptable educational attainment metrics (quantity) for their levels of income per capita, the quality of the education they are receiving remains relatively low. Investing in education infrastructure, teacher training, and incentive compensation schemes could alleviate this problem. Second, the perceptions of managers about a lack of an adequately educated workforce seem to be backed by the Caribbean reality. Outward migration from the Caribbean has been increasing over the past

30 years, and the migrant stock stands at approximately 37 percent of the Caribbean population. The educational attainment profile of emigrants confirms the brain drain hypothesis in the region, which has an unmet demand for high-skill workers while low-educated individuals are in excess supply in the labor market.

Policies aimed at investing in technical and vocational education incentivizing public-private partnerships between firms and tertiary education institutions could tackle the skill mismatch in the Caribbean and provide graduating students with skills that are in high demand in the job market. This would improve their job prospects and could potentially decrease the severity of the region's brain drain. In addition, another significant contribution would be the involvement of the private sector in skill development initiatives such as on the job training, apprenticeship programs, and corporate training programs for the upskilling of employees. These investments could be complemented by merit-based scholarship programs that require students to return to their home countries after completing graduate studies abroad. Such scholarships could be further better targeted to segments of the population with strong ties to their home countries and who are, therefore, more likely to return home for extended time periods.

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5

Breaking Boundaries: Business Innovation, Productivity, and Performance in the Caribbean

Sylvia Dohnert, Ricardo Sierra, and Nathália Pufal

Caribbean nations stagnated economically during the first two decades of the millennium, with real GDP growing at an annual average rate of 2.1 percent between 2001 and 2019.[1] By contrast, other small countries in the world grew at an average annual rate of 3.7 percent.[2] The COVID-19 pandemic halted tourism globally and had a tremendous impact on the Caribbean. The region had already been dealing with other economic and natural disasters, including hurricanes and high levels of indebtedness. Hence, by 2022, Caribbean countries' real GDP per capita was 4 percentage points lower than it had been in 2019.[3] The Caribbean therefore has an imperative to rapidly accelerate its growth rates if it wants to continue improving the quality of life for its citizens.

Like many other small countries, the small size of Caribbean countries exposes them to economic shocks, and their location makes them vulnerable to natural disasters. An analysis of the growth gap between Caribbean countries and the other small economies of the world identified lower total factor productivity (TFP) growth as the most important determinant of the gap (Ruprah, Melgarejo, and Sierra 2014). This is not surprising because, globally, productivity accounts for half of the differences in GDP per capita across countries (Easterly and Levine 2001; Cusolito and Maloney 2018). Productivity starts at the firm level and is related to how efficiently firms convert inputs into outputs.

1 Using data from the International Monetary Fund's World Economic Outlook database for 2023. GDP is expressed in constant international dollars per capita. Data are derived by dividing constant price purchasing power parity GDP by total population.

2 Defined as economies with a population of less than 3 million.

3 Authors' calculations using the International Monetary Fund's World Economic Outlook database for 2023, excluding Guyana.

One of the main drivers of productivity is business innovation, including the creation or adoption of technology (Kim and Loayza 2019) and the process of building capabilities over time. Building innovation capabilities is related to a firm's ability to integrate, build, and reconfigure internal and external competences to address changes, given path dependencies and market positions (Leonard-Barton 1992; Teece 2007; Zawislak et al. 2012; Börjesson, Elmquist, and Hooge 2014; Lee and Malerba 2017). Even in small countries such as those in the Caribbean, innovative firms have higher productivity than non-innovative firms. While firm characteristics such as size, access to public support for innovation, patent ownership, export behavior, and cooperation with other institutions for innovation account for some differences in productivity, research on this topic has demonstrated that the average productivity of Caribbean innovative businesses is higher and has less dispersion around the mean than Caribbean non-innovative businesses (Mohan, Strobl, and Watson 2016). Moreover, Caribbean firms that invested in innovation in the three years prior to COVID-19 had a positive effect on technical efficiency, which was expected to provide them with a better chance to withstand the downturn caused by the pandemic (Mohan and Strobl 2023).

Given the importance of business innovation to alter productivity and offer dynamic growth to the Caribbean region, this chapter will take a closer look at patterns of innovation and technology adoption in Caribbean firms—including the adoption of digital and climate technologies, which we will respectively call "digital innovation" and "green innovation." The chapter will use unique datasets tracing the behavior of Caribbean firms to explore their obstacles to innovate and adopt digital and climate technology, including how their innovation behavior and business-level capabilities changed over time. Another dataset tracing innovation behavior in Latin America will allow for comparison between the innovation patterns of Caribbean businesses and those of Latin American firms. Finally, the chapter will describe and examine the evolution of public programs and support systems that are in place to promote innovation and technology adoption in the Caribbean. The intention is to set the context for policy recommendations that could pave the way for a faster, more resilient recovery and sustained economic growth in the Caribbean.

This chapter will take advantage of three unique datasets at the firm level that have been collected by Compete Caribbean over time:[4] (i) the 2011

[4] The Compete Caribbean Partnership Facility is a private sector development program that aims to deliver innovative and practical solutions that stimulate economic growth, increase productivity, and foster innovation and competitiveness, while promoting economic inclusion. More information is available at https://www.competecaribbean.org

Caribbean Enterprise and Indicator (CES) Survey, carried out as part of the World Bank's Latin American and Caribbean Enterprise Surveys (LACES); (ii) the 2014 Productivity, Technology, and Innovation (PROTEqIN) Survey, which was an update of the CES 2011 exercise, keeping the same core questions, including modules on innovation behavior and labor management practices, and using a sample framework comprised of a panel of 96 percent of firms extracted from CES 2011; and (iii) the Innovation, Firm Performance, and Gender (IFPG) 2020 dataset, a third round of firm-level data that expanded the information collected in previous versions and included questions on digital technology, green innovation, and the impact of COVID-19 on firms.[5] The chapter also uses data from the Harmonized Latin American Innovation Surveys (LAIS) database published by the Inter-American Development Bank (IDB).[6] By presenting data from national innovation surveys conducted in various Latin American countries, the LAIS database enables a comparison of results between Caribbean and Latin American firms.

5.1. What Is the Innovation Behavior of Caribbean Firms?

The 2020 IFPG Survey collected data at the enterprise level from 1,979 firms across 13 countries in the Caribbean.[7] The samples for each country were designed to be representative of formal businesses with more than five employees in manufacturing or service industries.[8] Table 5.1 shows the distribution of firms by size, gender of the top manager, gender of the owners, and sector. Through weighted analyses, the dataset shows that, in comparison with Latin American countries, most Caribbean firms are small (57.6 percent) or medium-sized (32 percent), owned by men (81.3 percent) or led by men (75.5 percent), and in the services sector (83.6 percent). By

[5] See Compete Caribbean, https://www.competecaribbean.org/proteqin-ifpg-datasets/.

[6] For this chapter, 29,800 firms in Latin America were analyzed using the following filters for data selection: The most recent survey available and only surveys from 2013 onward, which caused the exclusion of the Dominican Republic from the database. The following countries were included: Argentina (2017), Chile (2017), Colombia (2017), Ecuador (2015), El Salvador (2013), Panama (2014), Paraguay (2016), Peru (2015), and Uruguay (2017). All manufacturing and some services industries were considered, as all these surveys cover the manufacturing sector and selected services in some countries. To analyze size, data of the first year was considered because it was more complete in the dataset. See Crespi et al. (2022) for more information on the LAIS.

[7] Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago.

[8] Most industries included in the sample frames are presented in IDB (2021, Table 2).

Table 5.1. Characteristics of Firms Analyzed (Percent)

	Analyzed Firms in the Caribbean (2020 IFPG dataset)	Comparison: Firms in Latin America (LAIS dataset)
Firm size		
Small (<20 employees)	57.6	35.9
Medium (20–99 employees)	32.0	38.9
Large (>=100 employees)	10.4	25.2
Gender (top managers)		
Men led	75.5	n.a.
Women led	24.5	n.a.
Gender (owners)		
Men owned	81.3	n.a.
Women owned	18.7	n.a.
Sector		
Manufacturing	16.4	64.8
Services	83.6	35.2
Direct exporting firms	35.6	23.6
Average firm age	30 years	28 years

Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender (IFPG) Survey and Harmonized Latin American Innovation Surveys (LAIS) datasets.
Note: n.a.: not available.

contrast, in Latin America more than half of firms are large (25.2 percent) or medium-sized (38.9 percent) and in the manufacturing sector (64.8 percent). This comparison is important because productivity tends to correlate with firm size, and typically the manufacturing sector embodies higher productivity (value-added produced by unit of input) than the services sector.[9] However, there is a higher proportion of exporting firms in the Caribbean (35.6 percent) than in Latin America (23.6 percent).

In terms of the patterns of innovation of Caribbean firms, the 2020 IFPG dataset is richer than the previous two Caribbean datasets (2014 and 2010) because, in addition to data on the general innovation patterns of Caribbean firms,[10] it also collected data on the digital and climate/green technology adoption patterns of those firms. We will call these digital and climate

[9] For a detailed discussion on the differences between services and manufacturing innovation, see Gallouj and Weinstein (1997), Agarwal and Selen (2009), Ettlie and Rosenthal (2011), Kindström, Kowalkowski, and Sandberg (2013), Crespi, Tacsir, and Vargas (2014), and Janssen, Castaldi, and Alexiev (2016).

[10] Following Oslo Manual definitions, see OECD and Eurostat (2018).

technology patterns "digital innovation" and "green innovation," respectively, as technology adoption supports the innovation capabilities and competitiveness at the firm level (Blichfeldt and Faullant 2021; Verhoogen 2021). This section will define and analyze these three types of innovation behavior (general, digital, and green), their prevalence, and the obstacles that Caribbean firms encounter and their perception of how these innovation behaviors affect their businesses in different ways.

Generally innovative firms are defined as the set of firms that introduced at least one of the following innovations:[11] new or improved goods, new or improved services, methods for producing goods or providing services, logistics, delivery, or distribution methods, methods for accounting and other administrative operations, business practices for organizing procedures or external relations, methods for organizing work responsibility, decision-making and human resource management, marketing methods for promotion, and packaging, pricing, and products.

Following Mohan, Strobl and Watson (2017), *potentially innovative firms* are defined as those that did not introduce any of the above-mentioned innovations but plan to pursue either product or process innovations in the next two years or consider at least one of the 14 barriers to innovation as major or very severe.[12]

The last category, *non-innovative firms*, are those firms that did not introduce any innovation and were not classified as potentially innovative.

The interconnection between digitalization and innovation has been widely studied. It is well established that digitalization acts as a powerful enabler of innovation by providing necessary tools to support and accelerate the innovation process. It also facilitates collaboration and co-creation among individuals and firms and generates vast amounts of data that can be analyzed to inform a firm's innovation efforts.

Therefore the interest here is to look at digital technology adoption as a specific case of innovation efforts, and to define *digital innovative firms* as

[11] This definition follows Mohan, Strobl, and Watson (2017) with the caveat that the types of innovative behavior that Caribbean businesses could exhibit was expanded between the 2014 PROTEqIN Survey and the 2020 IFPG survey.

[12] These obstacles are: the level of available financial resources; the financing of innovation (being too costly); qualification of employees; flexibility/openness of other companies of the sector for collaborative approaches; level of perceived economic risks and unwillingness of the enterprise to take risks; past failures of innovation; labor force lacking skills required for innovation; time to market; competitors too strong; market too small for the cost of innovation; current organizational/managerial culture; degree of self-confidence for innovation; compliance requirements to meet international standards; and intellectual property protection being too complex technically.

those that introduced methods for information processing and communication in the three years preceding the data collection through such technologies as the Internet, wireless networks, cell phones, computers, software, middleware, video conferencing, social networking, and other media applications and services enabling users to access, retrieve, store, transmit, and manipulate information in a digital form.[13] Meanwhile, *potentially digital innovative firms* are those that did not introduce methods for information processing and communication, but that foresee introducing changes related to digital methods or consider at least one of the 14 barriers to innovation as major or very severe (Tajvidi and Karami 2021). Finally, *digital non-innovative firms* are those that did not introduce methods for information processing and communication and did not foresee introducing these methods.

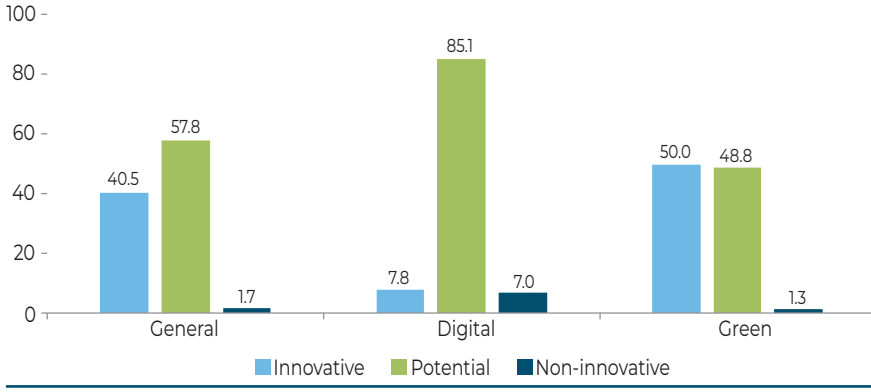
Finally, given the vulnerability of the Caribbean region to climate change and the importance of the natural environment, it is also important to understand the efforts undertaken by firms to address climate mitigation and environmental conservation. *Green innovative firms* are defined as those that introduced at least one of the following innovations: reduced material use per unit of output; reduced energy use per unit of output; reduced CO_2 footprint (total CO_2 production) in the enterprise; replaced materials with less polluting or hazardous substitutes; reduced soil, water, noise, or air pollution; or recycled waste, water, or materials. *Potentially green innovative firms* did not introduce any of the above-mentioned innovations, but plan to pursue product or process innovations in the next two years, or consider at least one of the 14 barriers to innovation to be major or very severe. *Green non-innovative firms* are those that did not introduce any green innovation and were not classified as potential green innovators. It is important to note that these categories of analysis are independent—a firm can be a general innovator, a digital non-innovator, and a potential green innovator.

5.1.1. *Types of Innovation*

Using the definitions described above, the analysis finds that 40.5 percent of Caribbean firms are general innovators, 57.8 percent are potential general innovators, and a mere 1.7 percent are general non-innovators (Figure 5.1; Box 5.1). In other words, most Caribbean firms are interested in developing new products and services, or improving the ways that they produce, sell, and distribute their products and services.

[13] See Agricultural Information Management System of the Food and Agriculture Organization (AIMS/FAO), Information and Communication Technologies (ICT), available at https://aims.fao.org/information-and-communication-technologies-ict.

Figure 5.1. Distribution of Firms in the Caribbean by Type and Level of Innovation (Percent)



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

A striking feature of this analysis is that most Caribbean businesses (85.1 percent) fall into the category of potential digital innovators. This indicates that in the Caribbean the use of digital technology, especially methods for information processing and communication, was relatively low at the time of the data collection (Box 5.2). Nonetheless, most firms recognized its importance and were either planning on introducing changes

BOX 5.1. LEVELS OF INNOVATION IN LATIN AMERICA

The IDB's Harmonized Latin American Innovation Surveys (LAIS) dataset was used to compare the innovation patterns of Caribbean businesses against those of Latin American firms. Although the survey questions used in Latin America were not exactly the same as the ones used in the Caribbean, the definitions for general innovation were comparable to those used above for Caribbean firms.[a] The definition of potentially innovative firms was also comparable, although the obstacles considered were somewhat different.[b] Non-innovative

[a] Firms that introduced at least one of the following during the reference period: a new good, service, or product; an improved good, service, or product; a goods innovation, service innovation, or product innovation; an innovation in methods of production, logistics and delivery, or process-supporting activities; a new process, improved process, or process innovation; new business practices in terms of processes, new methods for organizational responsibilities and decision-making, or new methods for organizing external relations with other firms or public institutions; an organizational innovation; an innovation in packaging; an innovation in product promotion; new methods of distributing or placing products on the market; new pricing methods for goods or services; or marketing innovations.

[b] The list of obstacles is as follows: difficulty to protect innovations; regulation; the fact that the market is dominated by established firms; high costs of innovation; lack of internal financial resources; innovation uncertainty; difficulty to find cooperation partners; organizational rigidity within the firm; lack of qualified human capital in the firm; lack of qualified human capital in the country; small market size; other obstacles to innovation.

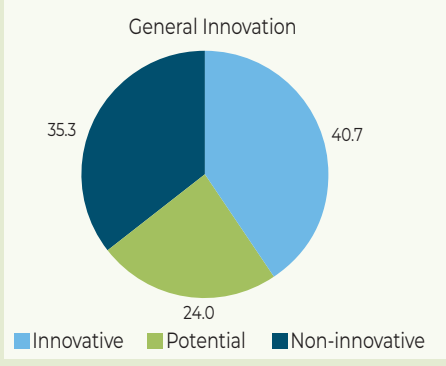
(continued on next page)

BOX 5.1. LEVELS OF INNOVATION IN LATIN AMERICA

firms are those that did not introduce any innovation and were not classified as potentially innovative. Comparisons on digital and green innovation could not be conducted due to the unavailability of comparable data within the databases.

Figure 5.1.1 shows that the distribution of firms by level of innovation in Latin America presents a pattern markedly different from that of firms in the Caribbean. In Latin America, most firms are considered innovative, with non-innovative firms constituting the second-largest group. Potentially innovative firms form the smallest group. In contrast, in the Caribbean, potentially innovative firms make up the majority within the general innovation category.

Figure 5.1.1. Distribution of Firms in Latin America by Level of Innovation (Percent)



Source: Prepared by the authors based on the LAIS dataset.

toward this end in the future and/or were facing obstacles to innovate. Meanwhile, a minority of firms were digital innovators (those that had already successfully implemented information and communications technology methods) or digital non-innovators (those uninterested in adopting digital technology), with each of the two categories accounting for only about 7 percent of firms.

The pattern of green innovation in the Caribbean is very different than that of general or digital innovation. A bit more than half of Caribbean firms have undertaken green innovative activities, and almost half are potentially green innovative, with green non-innovative firms representing a negligible minority. Even though the proportion of green innovators seems high, the breakdown of data elucidates that firms have achieved just a few environmental improvements in recent years, many of which are simple to achieve and require negligible or no resources, as further analysis will show. The highest proportion of environmental improvements involved recycled waste, water, or materials, with 28 percent of the analyzed firms having undertaken such efforts. A small minority of Caribbean firms undertook more complex measures, such as reducing the CO_2 footprint (only 16 percent of firms) or replacing materials with less polluting or hazardous substitutes (only 18 percent).

BOX 5.2. DIGITAL INNOVATION: A CLOSER LOOK

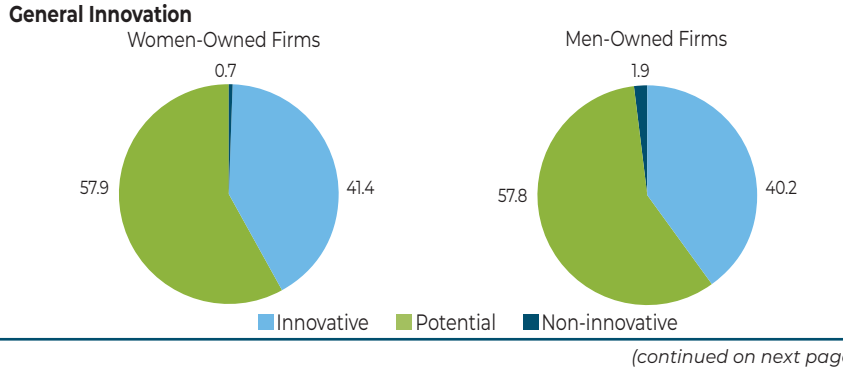
A closer look at one aspect of digital innovation—the acceptance of digital payments—can illustrate the scant adoption of digital technology by Caribbean businesses. The adoption of digital payments is still incipient in the Caribbean. Only 10 percent of innovative firms accept mobile money (such as Apple Pay or Bitt) and only 8 percent accept electronic payments through a money transfer service (such as Western Union). Digital innovators accept more mobile money (19 percent) and electronic payments through a money transfer service (13 percent) than other firms, but that percentage is still considered low. Green innovators accept mobile money (12 percent) and electronic payments through a money transfer service (11 percent) to a larger extent than general innovators.

5.1.2. *Does Gender Influence Innovation Patterns?*

To analyze whether gender matters in terms of innovation patterns, the distribution of innovative, potentially innovative, and non-innovative firms was analyzed and compared to the distribution of Caribbean firms according to the gender of the owners (Figure 5.2).[14] The distribution of general innovation patterns remains largely the same in men-owned and women-owned firms as in the general population of firms—that is, there does not appear to be a gender gap related to innovation behavior between men-owned and women-owned firms.

However, women-owned firms had a higher percentage of potential digital innovators and a lower percentage of digital non-innovators than men-owned firms, and this difference was statistically significant. This may

Figure 5.2. Distribution of Firms in the Caribbean by Type and Level of Innovation and Gender of Owner (Percent)



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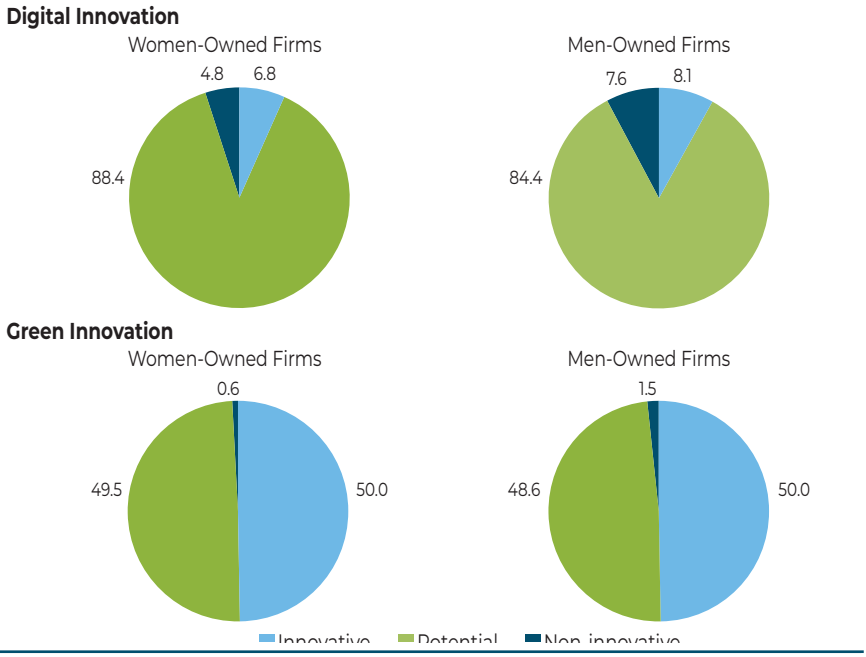
[14] Women-owned firms are defined as those whose owners/shareholders are predominantly or entirely women.

Figure 5.2. Distribution of Firms in the Caribbean by Type and Level of Innovation and Gender of Owner (Percent) *(continued)*



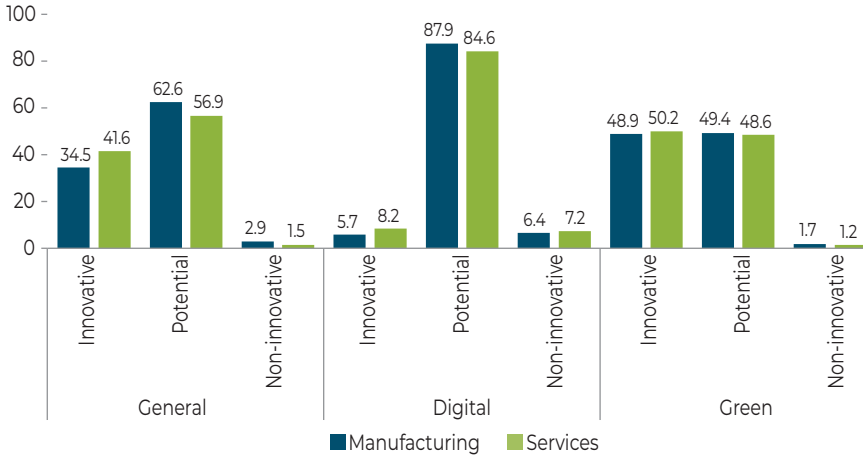
Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

indicate that women-owned firms are relatively more aware of the benefits of digital innovation. At the same time, their higher prevalence of digital potential innovators may indicate barriers to adopt digital technology that are greater than those faced by men-owned companies. Again, the difference is statistically significant. Considering green innovators, and similar to general innovation, the patterns of innovation are not significantly different between women- and men-owned firms.

5.1.3. *Does Sector Influence Innovation Patterns?*

General innovators seem to encounter obstacles across both manufacturing and services, as the percentage of potential innovators in both sectors is much higher than the proportion of innovators (Figure 5.3). Surprisingly, there is a higher proportion of innovators in services than in manufacturing. This pattern repeats for digital innovation, with relatively more digital innovation in services than in manufacturing. In contrast, for green innovation, about half of manufacturing and service firms are green innovative, with the other half being potentially green innovative.

Figure 5.3. Distribution of Firms in the Caribbean by Type and Level of Innovation and Sector (Percent)



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

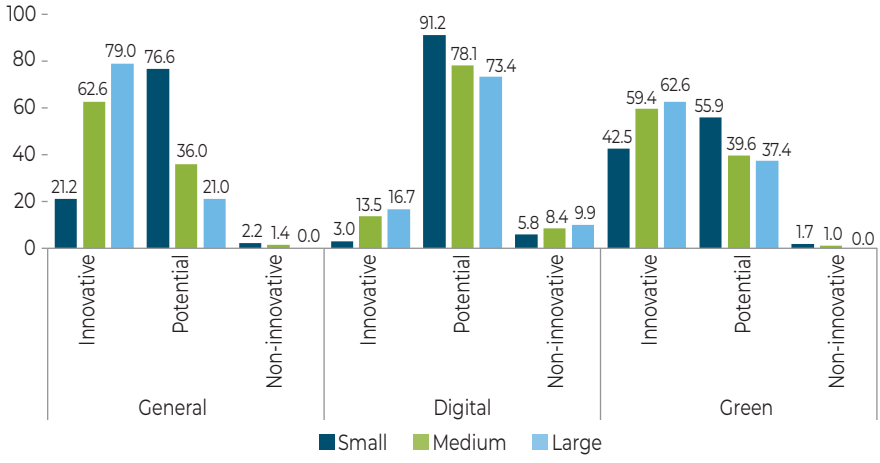
5.1.4. *Does Size Influence Innovation Patterns?*

A large proportion of small firms are in the potential innovator category across all three types of innovation, highlighting the importance of barriers inhibiting innovation by small firms (Figure 5.4). In terms of general innovation, large firms tend to be generally innovative and, to a lesser extent, potentially innovative. Similarly, a sizable proportion of medium-sized firms innovate. This points to two conclusions: (i) there is significant potential for innovation in the Caribbean and (ii) barriers to innovation are most prevalent among small firms.

In terms of digital innovation by firm size, there is a different pattern than what was seen with general innovation. Across the three firm size categories (small, medium-sized, and large), the proportion of potentially digital innovative businesses is highest. Moreover, as observed with general innovation, more small businesses fall into this category than medium-sized or large businesses. This indicates that (i) most Caribbean businesses of all sizes face barriers to innovate digitally and (ii) smaller Caribbean businesses face relatively more barriers to digital innovation than businesses of other sizes. Also of note is that there is a larger percentage of non-innovative large businesses than non-innovative medium-sized or small businesses.[15]

[15] Non-innovative large firms work mainly in wholesale (44.7 percent); non-innovative medium firms work mainly in construction (24.3 percent), wholesale (18.3 percent), and retail (17 percent); and non-innovative small firms work mainly in retail (36.6 percent).

Figure 5.4. Distribution of Firms in the Caribbean by Type and Level of Innovation and Firm Size (Percent)



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

The pattern of green innovation according to business size has some similarities to that observed with more general innovation. Large and medium-sized businesses have higher proportions of green innovative firms than potentially green innovative firms, and negligible proportions of green non-innovative firms. The small business category has a greater proportion of potentially green innovative firms, indicating that small firms face higher barriers to green innovation. However, similar to digital innovation, there is an interesting difference regarding large businesses: there is a much higher percentage of large potentially green innovative businesses (37.4 percent) than large businesses that have the potential to be generally innovative (21 percent), indicating that there could be a specific barrier affecting the capacity of large businesses to undertake green innovation.

5.1.5. *What Are the Main Obstacles to Innovation Faced by Firms?*

To start thinking about policy recommendations, it is illustrative to look more closely at the obstacles faced by innovators and potential innovators, and the differences between them (Box 5.3). As depicted in Figure 5.5, there are notable differences between the obstacles that each group confronts. For potential general innovators, the greatest obstacles are the qualifications of employees, the level of available financial resources, and the degree of self-confidence for innovation, followed by the current organizational and managerial culture. For innovators, the major obstacles are market size,

Figure 5.5. Obstacles to Innovation Faced by Firms in the Caribbean (Percent)

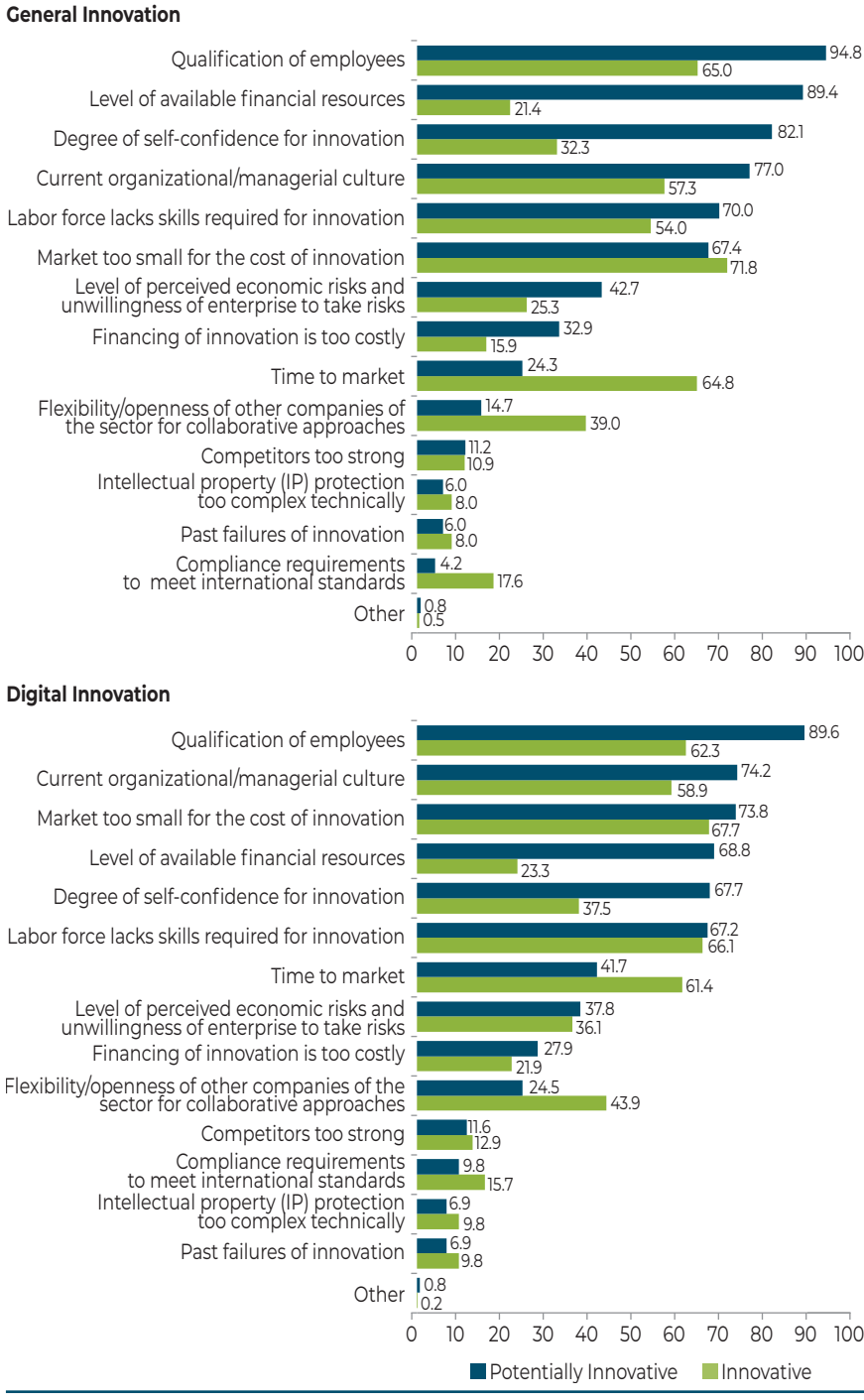


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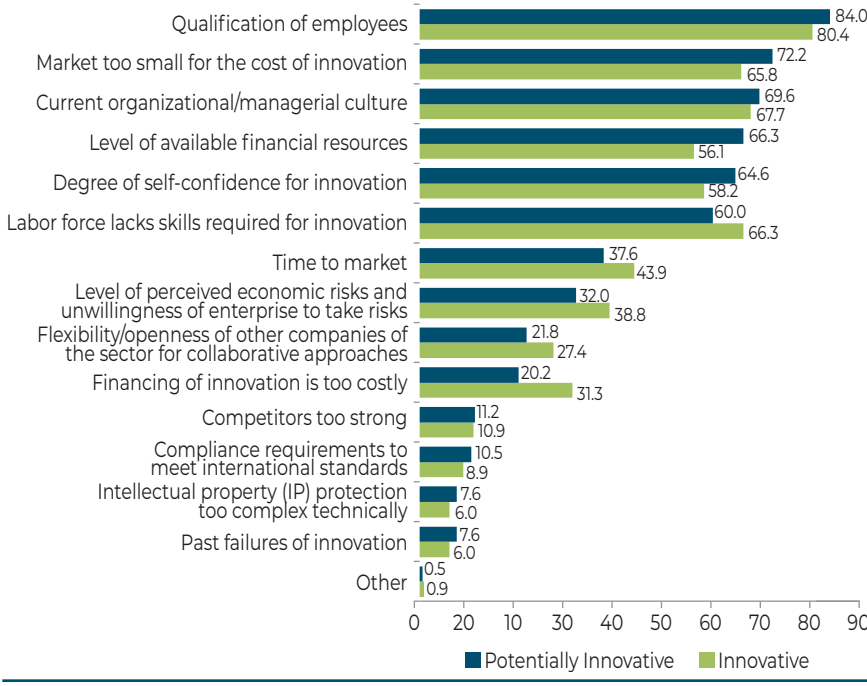
Figure 5.5. Obstacles to Innovation Faced by Firms in the Caribbean (Percent) *(continued)*

Green Innovation



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.
Note: Rank based on the prevalence of major and very severe obstacles.

followed by the qualifications of employees and time to market. The obstacles of time to market and the flexibility/openness of other companies in the sector are perceived as much more important by innovators than by potential innovators. One hypothesis is that these obstacles come into play once the innovation activities are under way—which would mean that potential innovators have not experienced them yet. Conversely, those obstacles that inhibit innovation activities during the early stages (e.g., availability of finance) are considered much more important—and presumably unresolved—by potential innovators.

The main barriers faced by potential digital innovators in the Caribbean are the qualifications of employees and the current organizational/managerial culture. Major or severe barriers that are similarly important to potential digital innovators and digital innovators are the market being too small for the cost of innovation and the labor force lacking skills required for innovation.

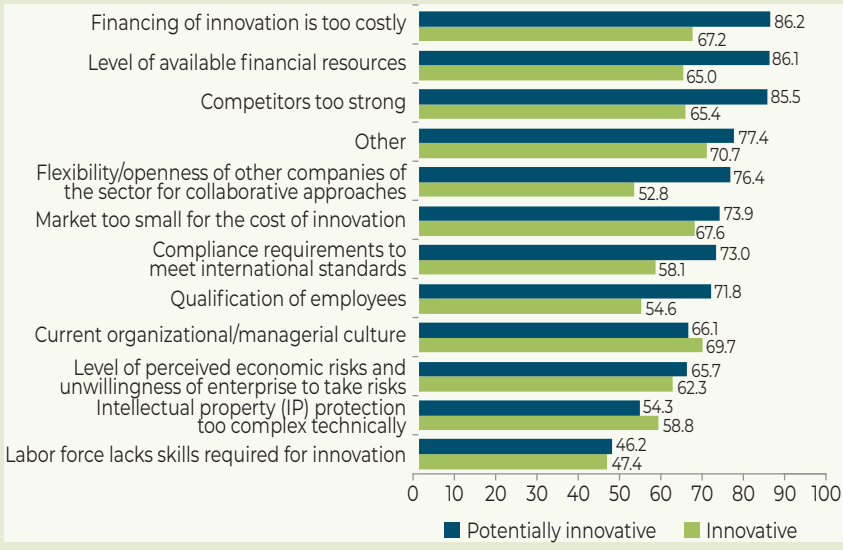
For green innovation, the barriers faced by Caribbean businesses are a bit less severe than those they face for general or digital innovation. The

BOX 5.3. OBSTACLES TO INNOVATION IN LATIN AMERICA

In terms of obstacles, potential innovators in Latin America evaluate the cost of financing innovation and the level of available financial resources as the main obstacles (Figure 5.3.1). The strength of competitors—an obstacle not seen as important in the Caribbean—also seems to be a main obstacle in Latin America.

In a second category of obstacles are the flexibility/openness of other companies for innovation, market size, the compliance requirements of international markets, and the qualifications of employees. Notably, the qualifications of employees is a much more important obstacle in the Caribbean than in Latin America—a difference that may be explained by a significant "brain drain" of tertiary-level educated people and the lack of tertiary-level institutions in some Caribbean countries.

Figure 5.3.1. Obstacles Considered to Be Important by Firms in Latin America (Percent)



Source: Prepared by the authors based on the LAIS dataset.
Note: Data not available for the following obstacles: past failures of innovation, degree of self-confidence for innovation, and time to market. The Harmonized Latin American Innovation Surveys dataset does not quantify to what extent the degree of self-confidence for innovation affects potentially innovative firms. For the Caribbean, it was one of the top five obstacles in the three categories of innovation analyzed here, and one of the top three for general innovation.

biggest obstacle for both green innovators and potential green innovators is the qualifications of employees. Other barriers considered major or severe by potential green innovators are the market being too small for the cost of innovation, the current organizational/managerial culture, and the level of available financial resources. This may be a reflection of the low

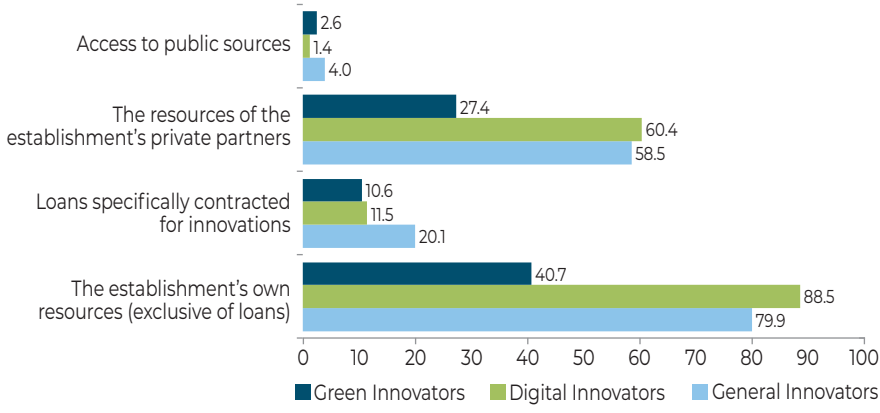
complexity of green innovation activities in Caribbean businesses, as discussed earlier.

5.1.6. *What Are the Main Sources of Innovation Financing?*

Not surprisingly, most innovators self-finance, and when they do take out loans to finance innovation the loans are not entirely dedicated to that end (Box 5.4). Few innovators have had access to public funds (Figure 5.6). The source of financing for digital innovation is comparable to general innovation. Most innovative businesses finance digital innovation with their own resources. There is, however, less access to public sources to finance digital innovation than to finance more general innovation or green innovation. Businesses also tend to borrow less for digital innovation and more for general innovation.

Compared to general innovators and digital innovators, green innovators use a much lower proportion of resources from their own establishment, from their partners, or from loans to finance their green activities. On the other hand, many of their green innovations required no additional financial investments (reflected in the high proportion of responses stating that the question was not applicable). This provides further evidence of the low complexity of green innovation efforts by Caribbean firms.

Figure 5.6. Innovation Financing in the Caribbean (Percent)

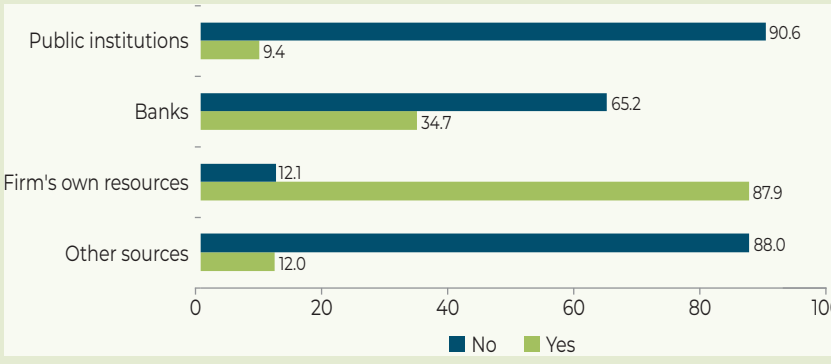


Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.
Note: In general, the answers were "Yes" or "No." However, for green innovators, there was a significant number of "not applicable" responses, which corresponds to the response option that states "When the question is clearly not applicable to the particular situation of the establishment." The figure shows only the percentages for "Yes" responses.

BOX 5.4. INNOVATION FINANCING IN LATIN AMERICA

In terms of innovation financing in Latin America, similar to the case in the Caribbean, most businesses use their own resources to innovate, followed by bank loans, other sources, and public institutions (Figure 5.4.1). Although the proportion of financing available from public institutions for innovation is the smallest of all sources of financing—as in the Caribbean—the level of such financing seems to be much higher for Latin America than for the Caribbean.

Figure 5.4.1. Sources of Innovation Financing in Latin America (Percent)



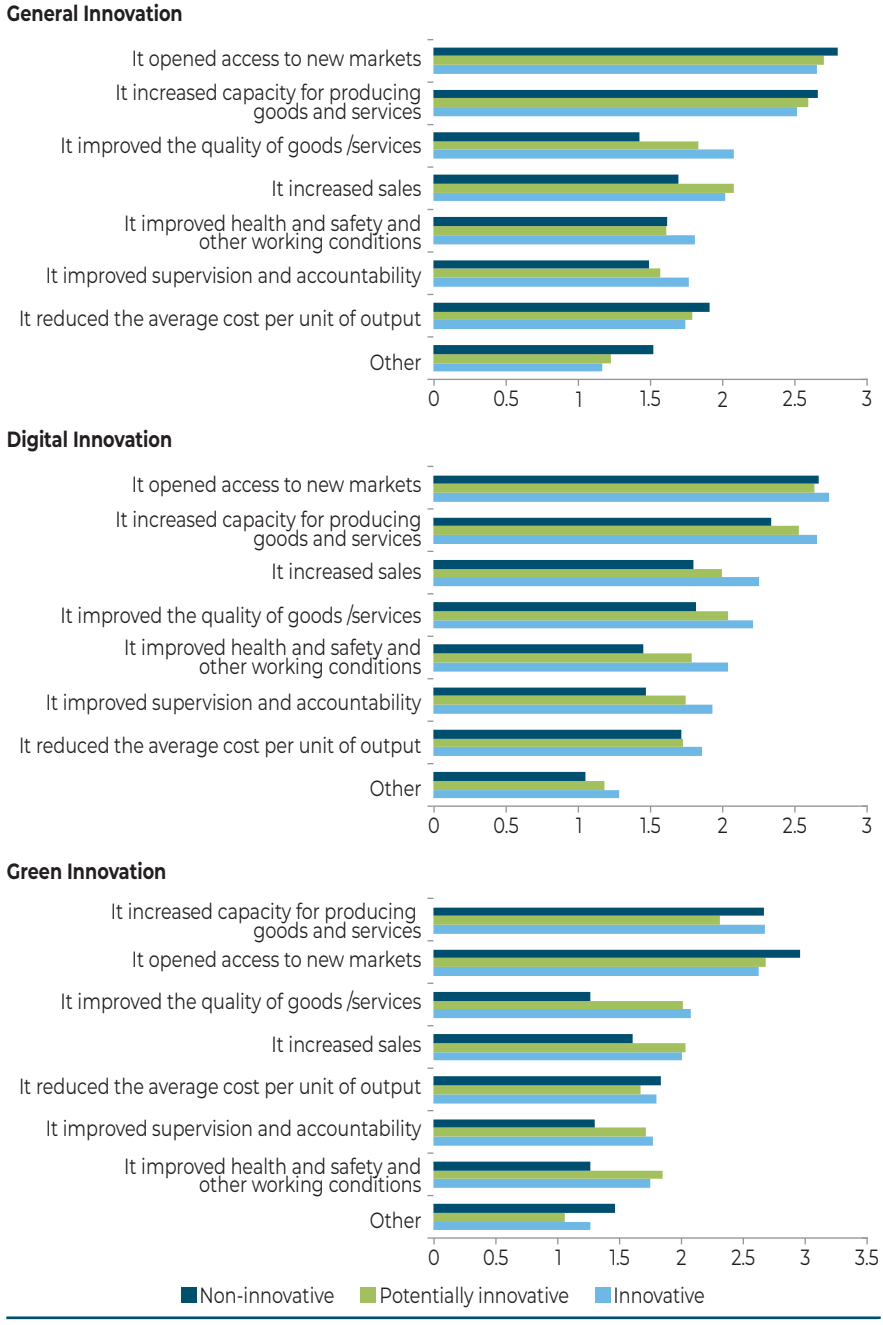
Source: Prepared by the authors based on the LAIS dataset.

5.1.7. *What Is the Main Impact of Innovation?*

Interestingly, Caribbean innovators, potential innovators, and non-innovators understand that general innovation opens access to new markets and increases their capacity to produce goods and services (Figure 5.7; Box 5.5). The areas where innovators perceive a greater impact than potential innovators and non-innovators, and which therefore make them a potentially motivating force to undertake innovation, are improving the quality of goods and services, health and safety and other working conditions, and supervision and accountability. The areas where non-innovators perceive that there is less impact as compared to innovators and potential innovators are improving the quality of goods and services, increasing sales, and improving supervision and accountability.

In terms of digital innovation, businesses—and especially those that are digitally innovative—perceive the impact of digital innovation on opening access to new markets and increasing their capacity to produce goods and services as equivalent to the impact of more general innovation. However, digital innovators rated digital innovation as having a higher impact on

Figure 5.7. Impact of Innovation on Caribbean Firms



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.
Note: The *x* axis captures the level of importance given by the firm on a scale from 1 ("Not important") to 5 ("Critical").

increasing sales, improving the quality of goods and services, and improving the health and safety and other working conditions than did general innovators. In terms of policy, this may indicate that a focus on supporting businesses to adopt digital technology has a higher impact on businesses' market expansion and quality offerings than does support for more general innovation.

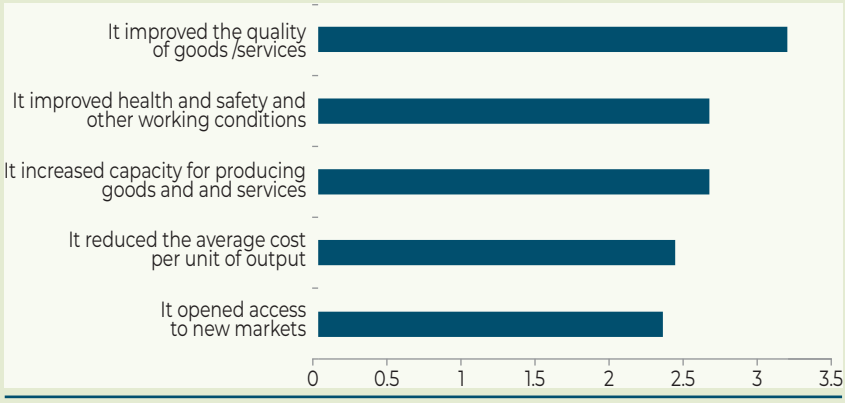
Caribbean businesses gauged the impact of green innovation roughly to the same extent that they assessed the impact of general and digital innovation. Green innovation is expected to have the greatest impact on increasing the capacity to produce goods and services, and on increasing access to new markets. It is also expected to have an impact on improving the quality of goods and services, and on increasing sales.

BOX 5.5. IMPACT OF INNOVATION IN LATIN AMERICA

While opening access to new markets is seen in the Caribbean as the main benefit from innovation, in Latin America this was the fifth-highest ranked impact, with improvement in the quality of goods and services as the most important one (Figure 5.5.1).

Given that businesses in both regions see the small size of the market as an obstacle to innovation, objectively speaking the size of the (domestic) market in the Caribbean is much smaller than any country in Latin America. So, it seems natural to think that for Caribbean firms, an innovation worth making is one that amplifies the size of the market.

Figure 5.5.1. Impact of Innovation in Latin America



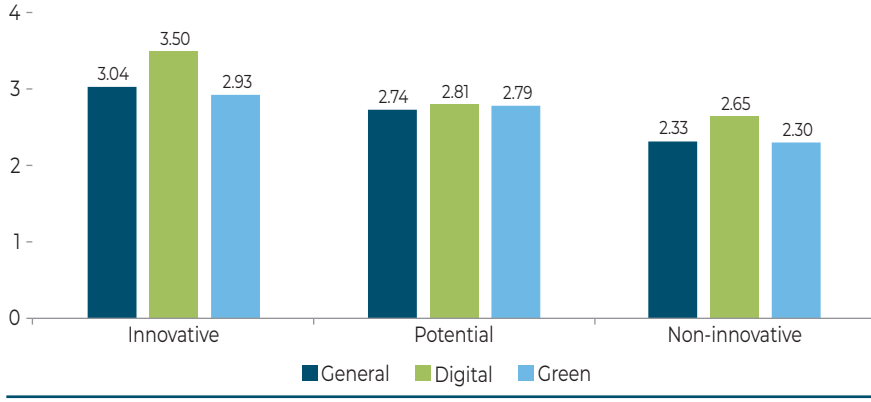
Source: Prepared by the authors based on the LAIS dataset.
Note: The *x* axis captures the level of importance given by the firm on a scale from 1 ("Not important") to 5 ("Critical").

5.1.8. *How Does Innovation Relate to Productivity?*

The analysis bears out that innovation indeed increases the productivity of firms. As Figure 5.8 shows, innovative businesses in the Caribbean have higher Total Factor Productivity (TFP) than potentially innovative and non-innovative businesses across all three categories of innovation (general, digital, and green).[16]

The data also show that innovative businesses across all three categories have higher sales per worker than potentially innovative and non-innovative businesses (Figure 5.9). The premium is highest for general innovation and digital innovation. A curious phenomenon is that for those two types of innovation, and especially for digital innovation, there are non-innovative businesses that seem to have higher sales per worker than do potentially innovative businesses. A hypothesis is that the motivation to innovate among potentially innovative businesses—especially those that are looking toward general innovation and digital innovation—is precisely to increase their sales per worker. If their sales per worker are already high, they are not interested in undertaking innovation efforts.

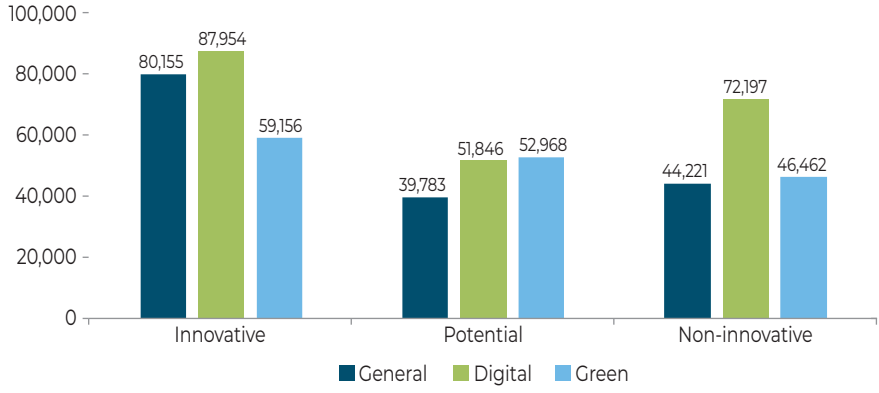
Figure 5.8. Total Factor Productivity in the Caribbean



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

[16] TFP was estimated using a Cobb-Douglas production function with three factors of production: capital, labor, and intermediate goods. Output is measured by firm sales in 2019; capital is measured by the replacement value of machinery, vehicles, and equipment declared by the firms in the survey; labor is measured by the total income of workers, including wages, salaries, and bonuses; and the value of intermediate goods is determined by the cost of raw and intermediate materials (or the cost of finished goods and materials purchased for sale by retail sector firms). Finally, TFP is estimated as the residual term in the production function.

Figure 5.9. Sales per Worker in the Caribbean (U.S. dollars)



Source: Prepared by the authors based on the Innovation, Firm Performance, and Gender Survey dataset.

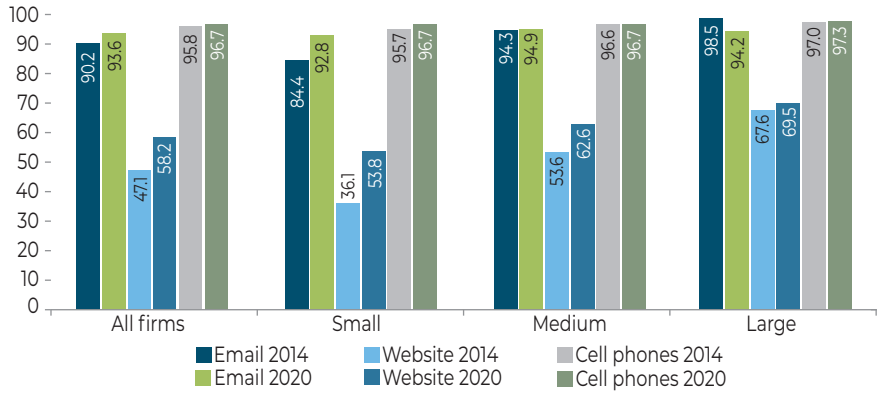
5.2. Differences over Time

After the in-depth analysis of the 2020 IFPG Survey data presented above, this section uses the data available to focus on how Caribbean firms have changed their behavior over time. Information about the innovation efforts of Caribbean businesses is scarce in the 2010 LACES. However, the 2014 PROTEqIN Survey includes innovation-related variables that were also included in the 2020 IFPG Survey and allow for relevant comparisons over time. This analysis will focus on general innovation and digital innovation patterns, since, prior to the IFPG dataset, there were no questions about green innovation.

As stated earlier, digital tools have become extremely important for all firms regardless of their size and industrial sector—especially after the COVID-19 pandemic. The tools enable efficient communication within a firm and externally with customers, suppliers, and partners. They also increase a firm's visibility and provide a channel for online transactions.

Figure 5.10 shows that Caribbean firms slightly improved their overall use of digital tools and built more digital capabilities between 2014 and 2020. The share of firms that use email to communicate with clients or suppliers increased 3.4 percentage points, from 90.2 to 93.6 percent. This could largely be attributed to major improvements in Guyana (16.5 percent) and Jamaica (11.5 percent). Small firms saw a significant increase in email use (8.4 percent), while the proportion of large firms using email decreased from 98.5 to 94.2 percent. Also, the share of small firms with a website increased from 36.1 percent in 2014 to 53.8 percent in 2020, leading

Figure 5.10. Use of Digital Tools in Caribbean Firms, 2014 and 2020 (Percent)



Source: Prepared by the authors based on data from the 2020 Innovation, Firm Performance, and Gender Survey and the 2014 Productivity, Technology, and Innovation Survey.

the overall increase along with medium-sized firms. However, there is still room for improvement in the use of this digital tool, as only 58.2 percent of Caribbean firms had their own website in 2020 compared to 68.2 percent of Latin American firms.

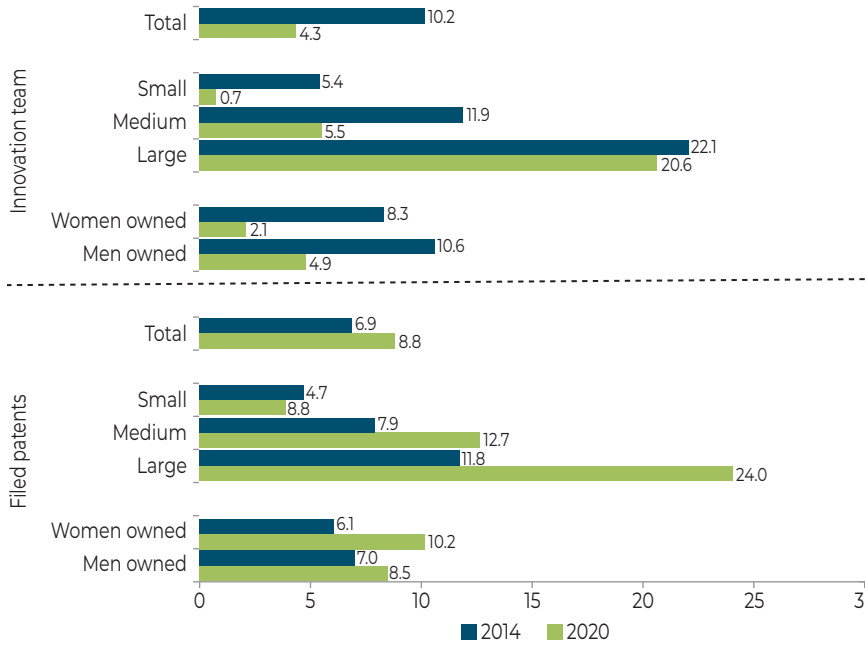
Another factor related to innovation that can improve a firm's performance is having a group of professionals dedicated to innovation. These innovation teams can anticipate customer needs and develop unique products, services, and processes to give their firms a competitive advantage in the market. The teams also usually foster a culture of creativity within the organization. Figure 5.11 shows not only that the share of firms having a department dedicated to innovation is low in the Caribbean, but that it decreased from 2014 to 2020. Moreover, Caribbean firms have fewer research and development employees than Latin American firms (1.3 versus 2.2 percent).

Guyana and Suriname had the greatest declines of firms with innovation teams (31.6 percent and 24.3 percent, respectively) and only Trinidad and Tobago and St. Lucia had an increasing share. The reduction persists across all firm sizes and regardless of the gender of the owners. However, women-owned and medium-sized firms had the most prominent declines, which could be related to the effect that COVID-19 had on these firms.

Having an innovation team can be closely related to a firm's patent filing activity because innovation professionals are more adept at recognizing ideas and technologies that have the potential to be patented.[17] An inno-

[17] Kerr and Kerr (2018) show that global collaboration and inventor teams appear to improve underperformance associated with foreign innovation by U.S. companies.

Figure 5.11. Caribbean Firms with Innovation Teams and Filed Patents, 2014 and 2020 (Percent)

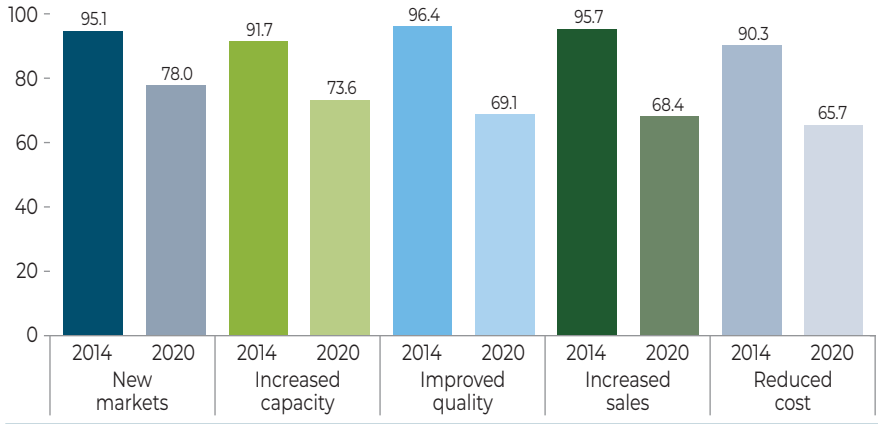


Source: Prepared by the authors based on data from the 2020 Innovation, Firm Performance, and Gender Survey and the 2014 Productivity, Technology, and Innovation Survey.

vation team can assess the value and commercial potential of different inventions within a firm. However, not all innovations that are implemented necessarily result in a patent application. Despite having a low proportion of innovation teams, 6.9 percent of Caribbean firms successfully filed patents, trademarks, industrial designs, or copyright registrations in 2014 (Figure 5.11). Contrary to the declining trend in terms of innovation teams, the average proportion of firms that filed patents, trademarks, industrial designs, or copyright registrations increased between 2014 and 2020, reaching an average of 8.8 percent. Consistent with the presence of innovation teams by firm size, the patent filing behavior among Caribbean firms is that large firms have consistently filed more patents than their small counterparts.

The results displayed in Figure 5.11 point to a deterioration in the presence of innovation teams but an improvement in patent filing among Caribbean firms over time. Two hypotheses behind the former result are a change in the survey instrument (making the definition of research and development professionals more specific in 2020), and the timing of the 2020 survey (amid the COVID-19 pandemic). The results could also be attributed to the firm's management perception about the returns to innovation.

Figure 5.12. Potential Impact of Innovation in the Caribbean, 2014 and 2020 (Percent)



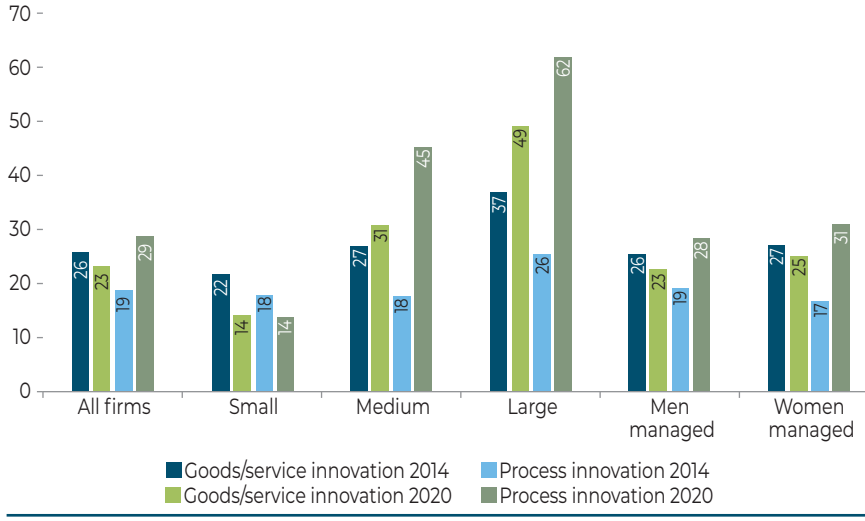
Source: Prepared by the authors based on data from the 2020 Innovation, Firm Performance, and Gender Survey and the 2014 Productivity, Technology, and Innovation Survey.
Note: The figure presents the percentage of firms that classified each potential impact as "very important" or "critical" on a scale that also includes "not important," "slightly important," and "important."

While returns to innovation may not always be immediate or easily quantifiable, innovation has been demonstrated to improve a firm's competitive advantage, enhance its reputation, and have other positive effects such as employee engagement and retention. Consequently, insight can be gained from assessing the perceptions of Caribbean firm managers themselves about the importance of innovating and its potential impact over time. Both the PROTEqIN and IFPG Surveys asked firm managers whether innovation (i) increased the number of goods/service lines offered in the market, (ii) increased sales, (iii) opened access to new categories of customers,[18] (iv) improved the quality of goods/services, and (v) reduced the average cost per unit of output.

Figure 5.12 shows a clear pattern: across all areas of potential impact, the subjective valuation of the effects of innovation deteriorated from 2014 to 2020. The proportion of firm managers that believed innovation had significant effects in past years was above 90 percent for all categories in 2014. However, the proportion of firms finding that innovation was important was relatively lower for all categories by 2020: opened access to new markets dropped to 78 percent; increased capacity to 73.6 percent; improved quality to 69.1 percent; increased sales to 68.4 percent; and reduced costs to

[18] There is a slight change in the exact wording of this potential impact. In the 2020 IFPG Survey, it was changed to "it opened access to new markets."

Figure 5.13. Caribbean Firms' Plans for Future Innovation, 2014 and 2020 (Percent)



Source: Prepared by the authors based on data from the 2020 Innovation, Firm Performance, and Gender Survey and the 2014 Productivity, Technology, and Innovation Survey.

65.7 percent. These systematic declines are persistent across firm sizes and the gender composition of firm owners.

The overall deterioration in managers' perceptions of the impact of innovation could be the driving force behind the previous results about innovation teams and patent filing in the Caribbean. Despite the negative results in terms of innovation teams and patents in the Caribbean, plans by firms to nevertheless pursue innovation activities in the future are encouraging. The share of firms with innovation plans for goods/services in the following two years declined slightly from 25.9 percent in 2014 to 23.3 percent in 2020 (Figure 5.13). This decline could be attributed to the 7.5 percent decline among small firms in the Caribbean. However, innovations in terms of production processes or service delivery increased between 2014 and 2020.[19]

There was also a 52.7 percent increase (from 19 to 29 percent) in the share of firms planning to pursue process innovations, and such a significant increase can be easily attributed to medium-sized and large firms. Another relevant distinction is that the share of women-owned firms planning to pursue such innovations increased by 83 percent

[19] This type of innovation is usually understood as the implementation of new or improved methods, techniques, or systems within a firm's operations or workflow, so it is correlated with efficiency enhancements, productivity, and cost-effectiveness metrics.

between 2014 and 2020 (from 17 to 31.2 percent) compared to a 46 percent increase among men-owned enterprises. This points to optimism among Caribbean firm managers shortly after being severely affected by the COVID-19 pandemic in 2020.

5.2.1. *Innovation Transitions*

To conclude the analysis of the innovation behavior of Caribbean businesses over time, this section relies on the panel dataset that can be constructed with the PROTEqIN and IFPG Surveys.[20] While these surveyed firms represent only 18.5 percent of the 2020 IFPG sample, the panel data analysis offers the unique opportunity to provide information about changes over time at the firm level. Following the innovation classifications used in the previous section, transition matrices are calculated for the general innovation and digital innovation classifications.[21] These matrices describe the transition of firms between different categories (innovative, potentially innovative, or non-innovative) or status over time (i.e., from 2014 to 2020) in a dynamic system.[22]

Table 5.2 shows that of the total number of innovative firms (112) in 2014, 66.1 percent remained innovative in 2020,[23] 22.3 percent transitioned to being potentially innovative, and 11.6 percent switched to non-innovative. A third of potentially innovative firms in 2014 became innovative by 2020, while a quarter transitioned to non-innovative. Finally, another posi-

[20] The sample was restricted here to 366 Caribbean firms that were interviewed in all rounds (2010, 2014, and 2020) of surveys.

[21] The innovation classification using 2020 IFPG data was easily replicated with the 2014 PROTEqIN dataset. However, there is a caveat when applying the digital innovation classification in 2014. The PROTEqIN Survey did not specifically ask about innovation in the form of methods for information processing and communication. Hence, digital innovation was constructed by combining innovations in "online promotion, use of new media and techniques" and "the development of online sales."

[22] The rows of a transition matrix represent the starting states or categories (in this case, the innovation grouping in 2014), while the columns represent the ending states or categories (same classification groups in 2020). Each element of the matrix represents the probability or proportion of units (firms) transitioning from the corresponding starting state to the corresponding ending state. Such matrices are commonly used in economic analyses for studying income mobility, population dynamics, or shifts in market shares.

[23] Innovation transition matrices have been used in other geographic contexts, but there is a scarcity of firm-level panel data analysis for Latin America. Suarez (2014) examined the relationship between past and present innovations for a group of Argentine firms from 1998 to 2006 and found a decreasing trend in innovation (only 47 percent of firms stayed innovative) between 2002 and 2004.

Table 5.2. General Innovation Transition Matrix for Caribbean Firms, 2014 to 2020 (Percent)

	Innovative 2020	Potentially Innovative 2020	Non-Innovative 2020
Innovative 2014	66.07	22.32	11.61
Potentially Innovative 2014	33.06	41.13	25.81
Non-Innovative 2014	47.69	31.54	20.77

Source: Prepared by the authors based on data from the 2020 Innovation, Firm Performance, and Gender Survey and the 2014 Productivity, Technology, and Innovation Survey.

tive result drawn from Table 5.2 is that almost half of non-innovative firms transitioned to being innovative, followed by 31.5 percent that became potentially innovative and only 20.8 percent that remained non-innovative. Results show that innovative firms tend to remain innovative, and many firms that were not innovative in 2014 improved by transitioning to being innovative in 2020.

The results for digital innovation are not as encouraging. Table 5.3 shows a clear pattern of Caribbean firms transitioning to potential digital innovation. That is, in 2020, most Caribbean firms switched to potential innovation (or stayed, in the case of potential innovators), regardless of their 2014 innovation classification. However, when focusing on 2014 innovative firms, there was a substantial deterioration in terms of digital innovation, as 30.2 percent moved away from being innovative to being non-innovative in 2020. A similar pattern is seen for 2014 potential innovators (and non-innovators). Two factors may be underlying these movements. First, given changes in digital technology, what was considered innovative in 2014 may not have been considered innovative in 2020. Second, and related, digital innovation was not captured in the same way during both survey editions. Hence, digital innovation in 2014 could be capturing a different behavior (leaning more toward online promotion and sales) than in 2020 (methods for information processing and communication).

Table 5.3. Digital Innovation Transition Matrix for Caribbean Firms, 2014 to 2020 (Percent)

	Innovative 2020	Potentially Innovative 2020	Non-Innovative 2020
Innovative 2014	13.21	56.6	30.19
Potentially Innovative 2014	10.19	55.56	34.26
Non-Innovative 2014	9.27	60.49	30.24

Source: Prepared by the authors based on data from the 2020 Innovation, Firm Performance, and Gender Survey and the 2014 Productivity, Technology, and Innovation Survey.

5.3. Public Policies to Improve Business Innovation Capabilities in Caribbean Firms

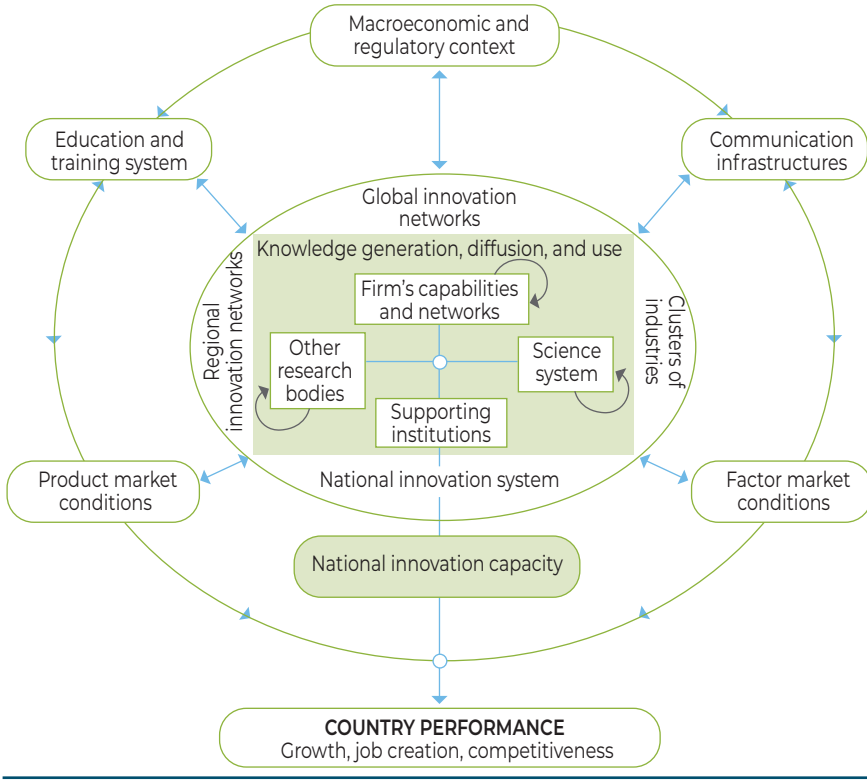
Substantial research has demonstrated that it is not possible to foster growth by simply developing domestic markets and liberalizing international transactions. Some form of active public policy is needed. As innovation is widely considered to be a primary source of economic growth, policies to encourage firm-level innovation and business development are high on the agendas of most developing countries, especially those that are catching up (Lee 2019). These policies arise from learning from evidence of market and coordination failures surrounding the innovative and productive-enhancing activities of firms (Bernini, Figal Garone, and Maffioli 2017).

Innovation systems play a crucial role in driving economic growth by bringing together various relevant actors involved in the innovation process, such as universities, research institutions, businesses, and government agencies, thus facilitating knowledge creation and diffusion. Within a functioning innovation system, these actors share their expertise and exchange ideas, generating a virtuous cycle, fostering a continuous learning process, and encouraging the creation and spread of knowledge and technology transfer. This, in turn, contributes to increased innovation capability, competitiveness and economic growth. Furthermore, functioning innovation systems foster entrepreneurship and new business creation, encouraging risk-taking, experimentation, and the commercialization of new ideas. Hence, developed innovation systems encompass innovation mentoring, incubation, and acceleration functions through specialized agents, as well as through networks that help innovating entrepreneurs and small businesses market their products and services (Goñi Pacchioni and Reyes 2019). This dynamism contributes directly to job creation and overall economic growth.

Countries with sound innovation systems can attract investment and skilled talent from around the world, as companies are attracted to locations in supportive ecosystems that encourage innovation. Hence, if countries can nurture innovation systems, they will likely create an attractive environment for foreign (and domestic) investment, leading to job creation, economic growth, and retention of skilled people who can add value to their respective firms.

Figure 5.14 shows the relevant actors and linkages of innovation systems. It puts firms, their capabilities, and networks at the core of such systems, along with supporting institutions, research bodies, and the science system. These actors serve as the abovementioned channel for growth by contributing to knowledge generation, diffusion, and use. This process reinforces itself to promote more innovation and is enriched by a country's

Figure 5.14. Actors in the Innovation System



Source: OECD (1999).

communications infrastructure, product and factor market conditions, education and training system, and macroeconomic and regulatory context. From this perspective, the innovative performance of an economy depends not only on how the individual actors perform, but on how they interact with each other as elements of a collective system (OECD 1999).

5.3.1. *What Policies Are in Place to Support Innovative Entrepreneurs and Businesses in the Caribbean?*[24]

Although the Caribbean has much to gain from stimulating entrepreneurship and innovation, few countries have made systematic efforts to

[24] This section is informed by the work of Compete Caribbean to support entrepreneurs, innovative businesses, and the innovation systems that support them in the Caribbean, some of which have been scaled up with financing from the IDB and other multilaterals.

support their entrepreneurs and innovators. Most Caribbean countries have small-scale, time-limited, and/or donor-financed initiatives that offer small amounts of seed capital to help businesses explore new products, services, and business models. Even in the countries where these initiatives exist, the entrepreneurs that benefit from them lack follow-up supportive ecosystems to develop into start-ups and scalable enterprises that would attract private capital and make these economies more dynamic. So while these initiatives certainly add value in what is otherwise a barren landscape of support for entrepreneurs, they underscore the lack of attention by policymakers to boosting growth through public support for entrepreneurship and innovation. Indeed, according to 2020 IFPG Survey data, only 13.7 percent of businesses in the Caribbean were aware of technical assistance programs for technology adoption and management improvements, and only 1.3 percent of Caribbean businesses had received support from these programs. This contrasts with hard evidence that shows that those Caribbean businesses participating in public innovation support programs saw significant effects on sales and the ability to develop new goods and services or production processes, as well as to obtain quality certifications (Bernini, Figal Garone, and Maffioli 2017).

Jamaica is an exception. In 2018, Jamaica launched an ambitious US$25 million program called Boosting Innovation, Growth and Entrepreneurship Ecosystems (BIGEE), financed by the IDB and carried out by the Development Bank of Jamaica (DBJ).[25] The program supports businesses at all stages of their lifecycle, providing seed capital, start-up capital (through support to a side-car fund and a venture capital fund), and financing for already existing businesses that want to develop new products and services.[26] The program also strengthens and aligns the entire ecosystem to support entrepreneurship and innovation by working through public and private incubators and accelerators to support entrepreneurs and innovative firms. BIGEE also stimulates university-industry collaboration through tech transfer. The government of Jamaica may inject another IDB-financed US$25 million to expand the benefits of BIGEE and to build out the DBJ's capabilities to act as an innovation agency.

The government of Belize is also making concerted efforts to support entrepreneurs and innovators. In 2021, the government signed an Innovation Pact with the private sector that recognizes innovation as an engine

[25] For more information about the program, see the BIGEE website at https://thinkbigee.com/about-us/.

[26] This is one of the Compete Caribbean projects that scaled up into a full-fledged ecosystem for an entrepreneurship and innovation program.

of growth and includes the government, firms of all sizes, associations, investors, academia, the media, and citizens in general.[27] The pact aims to promote innovation through digitalization of small and medium-sized enterprise talent, incubation support, and innovation clusters. Businesses that join the Innovation Pact have the benefit of being able to access innovation behavior benchmarking analysis that they can use to support their innovation efforts. Digital Innovation to Boost Economic Development in Belize, an IDB-financed program (US$10 million) to promote growth through digital technology adoption, supports implementation of certain aspects of the Innovation Pact in micro, small and medium-sized enterprises (MSMEs).[28]

Barbados has signaled interest in supporting innovation since the creation of the Ministry of Industry, Innovation, Science and Technology. Although the ministry initially focused on digitalizing public services for citizens, more recently it has embarked on promoting private sector innovation through Export Barbados.[29] The most salient efforts include exploring ways to develop Barbados' life sciences industry, a clean tech incubator financed by the United Nations Industrial Development Organization, and addressing multiple entrepreneurship challenges in different sectors (i.e., the blue economy). FutureBARBADOS, based in the Office of the Prime Minister, is exploring the launch of a regulatory sandbox to attract global startups to Barbados and has hosted several hackathons to support Barbados-based tech entrepreneurs.[30] TEN Habitat provides private acceleration services to Barbados and Caribbean entrepreneurs.[31]

The University of the West Indies plays a large role in the innovation ecosystem in Trinidad and Tobago through its St. Augustine Centre for Innovation and Entrepreneurship (STACIE), which supports university-based entrepreneurs through a public fund.[32] The center is exploring mechanisms to actively support tech transfer through the use of technology developed by the university or private sector parties. UWI Ventures Limited, a new private-sector-led university initiative, aims to provide venture capital to innovative start-ups and businesses in Trinidad and Tobago and other Caribbean countries. The government of Trinidad and Tobago is also

[27] See Beltraide, available at https://www.beltraide.bz/innovationpact.html.

[28] For more details about the project, see https://www.iadb.org/en/whats-our-impact/BL-L1039.

[29] See the Export Barbados website at https://exportbarbados.org/.

[30] See the FutureBARBADOS website at https://futurebarbados.bb/.

[31] See the TEN Habitat website at https://www.tenhabitat.com/.

[32] For information about STACIE, see their website at https://sta.uwi.edu/stacie/. There is uncertainty about the replenishment of the public fund mentioned here.

supporting a Developer's Hub to stimulate digital solutions developed by entrepreneurs and innovators to address public problems.[33] Draper University—an entrepreneurial educational initiative supported by Silicon Valley—has established a privately financed affiliate in Trinidad and Tobago to serve the region.[34]

In Guyana, support for entrepreneurship comes from the Centre for Local Business Development,[35] which is financed by firms involved in the Stabroek Block co-ventures, including ExxonMobil, Hess, and CNOOC International. The program was established to promote supplier linkages to opportunities offered by the burgeoning offshore oil and gas sector by maximizing skill development, adopting international standards, and supporting the transfer of technology. In addition, there have been initiatives to fulfill the vision of Guyana as a breadbasket for the Caribbean, including a government-launched Agriculture and Innovation Entrepreneurship Programme, and the Guyana Economic Development Trust,[36] a privately financed initiative that hosts the annual Guyana Innovation Prize and offers pre-seed financing to commercially viable and scalable business ideas.

In Suriname, the Competitiveness Unit Suriname within the Ministry of Economic Affairs, Entrepreneurship and Technological Innovation has played a large role in supporting innovative ventures.[37] Initially, it supported the development of cluster projects with an IDB-financed competitiveness program. In upcoming years, with World Bank financing, it will support innovative entrepreneurs and digital transformation of Surinamese businesses.

The Bahamas Access Accelerator, which is the Small Business Development Center of The Bahamas, runs programs that support technology adoption and/or innovation in specific sectors, including programs with IDB Lab support.[38] With The Nature Conservancy and technical support from the IDB, the Access Accelerator is currently building a blue economy

[33] See the Ministry of Digital Transformation's Developers' Hub website at https://mdt.gov.tt/digital-solutions-services/developers-hub/.

[34] See the Draper Startup House website at https://draperstartuphouse.com/trinidad-and-tobago.

[35] See the Centre for Local Business Development website at https://centreguyana.com/.

[36] See the Guyana Economic Development Trust website at https://theguyanatrust.org/.

[37] See the Competitiveness Unit Suriname website at https://www.surinamecompete.org/?lang=en.

[38] See The Bahamas Small Business Development Centre website at https://www.accessaccelerator.org/.

accelerator. The Bahamas has an interesting model to finance entrepreneurs beyond their early stages: The Bahamas Entrepreneurial Venture Fund,[39] which is financed through annual contributions from the government of The Bahamas (in addition to return on debt) and run by the private sector. The fund provides equity, venture capital, and subsidized debt to promising, growth-oriented businesses,[40] getting many of its leads from the Access Accelerator. However, support from both the Access Accelerator and the fund is less available in the Family Islands.

In the Eastern Caribbean, the Organisation of Eastern Caribbean States (OECS) Secretariat plays a major role in supporting existing and emerging businesses through its Competitive Business Unit.[41] Existing programs support youth entrepreneurs, agri-business and manufacturing, the creative sectors, digitally based businesses, and green entrepreneurs. As a subregional organization, the OECS depends on contributions from the Eastern Caribbean governments, and many of these programs are donor-financed. At the national level, the Eastern Caribbean countries have scant support for entrepreneurship and innovative ventures, with the exception of sporadic donor-financed programs. Business support organizations working at the national level focus their services on building the day-to-day operational capacity of MSMEs in such areas as management, record-keeping, and financial statements. Entrepreneurship/innovative business support services and a wider range of services are limited, despite increasing demand from the clients of business support organizations for innovation and technology adoption services. Compared to larger Caribbean countries, the relative scarcity of tertiary-level educational programs restricts the infusion of knowledge into the ecosystems of Eastern Caribbean states.[42]

Given the small size of the Caribbean economies and their diseconomies of scale at many levels, it may make more sense to provide more specialized entrepreneurship services regionally, including acceleration, private equity, and venture capital, or in specialized sectors. In this sense, Tech Beach, an initiative supported by IDB Lab and the Caribbean Development

[39] See The Bahamas Entrepreneurial Venture Fund website at https://www.bahamasventurefund.com/.

[40] Throughout its lifetime, the fund has invested US$12 million in over 100 companies, with some investments returning 20 percent.

[41] See the OECS website at https://www.oecs.org/en/development-of-businesses-in-the-eastern-caribbean.

[42] Only Antigua and Barbuda has a university campus affiliated with the University of the West Indies. All countries have Open UWI campuses, which offer a limited number of university degrees virtually. The Eastern Caribbean countries also have community colleges, which offer more technical tertiary (non-university) degrees.

Bank (CDB), provides acceleration services at the regional level and now provides a regional forum to make global connections.[43] The Caribbean Cultural and Creative Industries Innovation Fund, financed by the CDB, supports the development and competitiveness of the region's creative industries sector.[44] The forthcoming Caribequity, a regional equity fund financed by the European Union and IDB Lab, will fill important gaps for start-up support. In terms of digital innovation, the Caribbean Export Development Agency has received IDB financing to develop the Caribbean Digital Transformation Institute, which will start with a Digital Checkup tool that allows MSMEs to benchmark their level of digital maturity.[45] The institute will also offer customized courses to help MSMEs increase their level of maturity and will coordinate all national business support organization efforts in support of digital transformation of MSMEs.

The Compete Caribbean Partnership Facility, a program for private sector development through innovation financed by the IDB, the governments of the United Kingdom and Canada, and the CDB, is a regional public ecosystem generator that provides initial support for many of the public initiatives listed in this summary that have then taken on a life of their own.[46] One of these initiatives is the Caribbean Economics of Innovation network, a group of 60 policymakers and academics across 13 countries that have been immersed in the theory of economics of innovation and are intent on transforming the region's economies.

Despite all these efforts by donors, Caribbean countries need to inject many more resources into developing entrepreneurship and innovation systems that can support new and scalable products, services, and business models to drive the new wave of Caribbean growth. Except for Jamaica, current national ecosystems are fragmented—supporting just one stage of the entrepreneurial life cycle, and/or available in just some areas of the country. They are also under-resourced: only 1.9 percent of Caribbean business innovation is financed by public sources, producing a mere trickle of innovative businesses when a torrent of innovation is required to turn around the Caribbean's persistent low growth rates. As a result, the Caribbean is missing the opportunity to have private impact investors scouting the region for innovative projects and meeting the needs of early-stage

[43] See the Tech Beach website at https://www.techbeach.net/.

[44] See the CDB website at https://www.caribank.org/our-work/programmes/cultural-and-creative-industries-innovation-fund.

[45] See the Caribbean Export Development Agency website at https://carib-export.com/. For information on the Digital Checkup tool, see https://digitalcheckup.carib-export.com.

[46] See the Compete Caribbean website at https://competecaribbean.org/.

firms, most of which require sophisticated acceleration services to become investment ready. Moreover, the data presented in Section 5.2 provides evidence of the need to significantly increase public support during the early stages of the development of firms, and to leverage additional actors during their later stages.

5.4. Conclusions

Growth in the Caribbean has stagnated for many decades, with national GDPs significantly contracting during COVID-19. At the heart of this growth debacle is very slow productivity growth. This chapter has documented that many Caribbean businesses are interested in expanding their general, digital, and green innovation efforts, and that those that are already undertaking such innovation derive significant benefits in terms of new markets, capacity to produce products and services, and increased sales, productivity, and resilience to external shocks such as COVID-19. However, the chapter has also shown that many Caribbean firms face significant challenges to bolster innovation that require policy responses. Strengthening innovation efforts of Caribbean businesses requires public mechanisms to reduce obstacles to innovation, including by addressing market failures (i.e., financing for risky ventures) and increasing the provision of public goods (i.e., qualification of employees).

Most Caribbean countries do have some version of entrepreneurship and innovation support programs. However, except for Jamaica, these programs are fragmented—supporting just one phase of the entrepreneurial life cycle, and/or not encompassing the entire country—and insufficient in the scale of investment to produce enough innovative businesses that can make their economies more dynamic. Although some donor and privately financed regional initiatives are filling certain gaps, much more public support is required at the national level to develop entrepreneurship and innovation ecosystems that can support a large enough pipeline to turn the region's growth trajectory around.

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6

Capitalizing Paradise: Overcoming Barriers to Finance and Fueling Private Sector Growth in the Caribbean

Maria Cecilia Acevedo, Khamal Clayton, Henry Mooney, Ricardo Sierra, and Patricia Yañez-Pagans

Access to finance has been widely identified as one of the biggest obstacles for the operations of Caribbean firms (Ruprah and Sierra 2016; Beck and Mooney 2021). Empirical evidence has also shown that inadequate access to finance impairs firm productivity (Beck, Levine, and Loayza 2000; Ferrando and Ruggieri 2018; Levine, Loayza, and Beck 2000; Motta 2020). This chapter considers financial development in the Caribbean and the financing behavior of firms in order to better understand their challenges and limitations. Following an overview of economic and financial development issues at the macro level, the chapter analyzes firm-level data to assess financial constraints, their relationship with performance, and the evolution of that performance over time. Following Kuntchev et al. (2013), firms are classified as fully credit-constrained, partially credit-constrained, or not credit-constrained in order to determine how these categories are related to firm performance and analyze which firm characteristics are associated with better access to financing. The chapter also takes advantage of the panel structure of the Innovation, Firm Performance, and Gender (IFPG) Survey to compare access to finance between 2014 and 2020 with transition probability matrices.

In their book about unleashing growth and strengthening resilience in the Caribbean, Srinivasan et al. (2017) provide a comprehensive diagnosis of the main economic and financial challenges faced by Caribbean policymakers. They compile a series of policy recommendations to promote a sustained and inclusive increase in economic well-being and call for greater regional coordination to identify solutions to address the Caribbean's intertwined macroeconomic and structural challenges. In her chapter on finan-

cial development and inclusion, Wong (2017) highlights the characteristics of the Caribbean that may pose challenges to financial development and inclusion. These include the countries' (small) size and scale, historically low growth and high levels of debt, and vulnerability to external shocks and natural disasters. Wong (2017) examines the state of financial development and inclusion in the Caribbean by using a financial development index (Heng et al. 2016), a micro-founded structural model, and a case study for Jamaica. She concludes that Caribbean financial systems are relatively well developed but that financial inclusion could be improved. She also points out that existing data gaps hamper analysis for most countries in the region and demand-side data collection should be improved to help diagnose problems, identify constraints, and design policies and monitor their impact.

This chapter aims to close this data gap identified by Wong (2017) by combining country-level data with 2020 IFPG Survey firm-level data to assess the Caribbean's degree of financial development and reveal any outstanding issues.

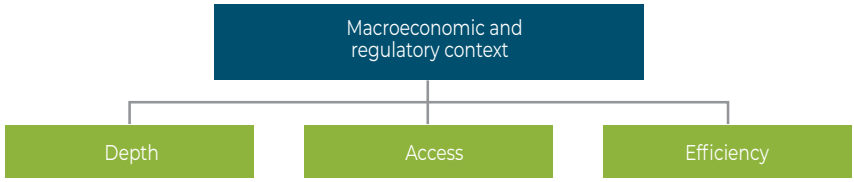
6.1. Financial Development: Depth, Access, and Efficiency in the Caribbean[1]

Before delving into regional and country-specific indicators of financial development and access, it is important to define a few key concepts and their implications for development and performance. Financial institutions and markets fulfill several critical functions in modern economies, including (i) enabling transactions across space and time, thus facilitating the division of labor and specialization in the economy; (ii) pooling savings and intermediating them to enterprises and households in need of external funding; (iii) screening borrowers and their projects and monitoring them, thus determining where society's scarce resources are being invested; (iv) reducing liquidity risk for savers by providing ready access to their funds while investing the same resources for long-term purposes; and (v) enabling cross-sectional and intertemporal risk diversification. Owing to data availability and comparability, this section focuses on financial development in the six member countries of the Inter-American Development Bank's (IDB) Caribbean Country Department,[2] with a particular emphasis on firms' access to finance, which is one of the three broadly acknowledged pillars of financial development (depth, access, and efficiency) (Figure 6.1).

[1] This section draws on Beck and Mooney (2021).

[2] The Bahamas, Barbados, Guyana, Jamaica, Suriname, and Trinidad and Tobago.

Figure 6.1. Financial Development: Selected Subcomponents and Indicators



	FINANCIAL INSTITUTIONS	FINANCIAL MARKETS
DEPTH	• Private sector credit (percent of GDP) • Pension fund assets (percent of GDP) • Mutual fund assets (percent of GDP) • Insurance premiums, life, and non-life (percent of GDP)	• Stock market capitalization to GDP • Stocks traded to GDP • International debt securities, government (percent of GDP) • Total debt securities of corporations (percent of GDP)
ACCESS	• Branches (commercial banks) per 100,000 adults • Tellers per 100,000 adults	• Percent of market capitalization outside of top 10 largest companies • Total number of issuers of debt (domestic and external, nonfinancial corporations, and financial corporations)
EFFICIENCY	• Net interest margin • Lending-deposit spread • Non-interest income to total income • Overhead costs to total assets • Return on assets/Return on equity	• Stock market turnover ratio (stocks traded/capitalization)

Source: Beck and Mooney (2021).

6.2. Financial Development and Access: The Cornerstones of Development

Empirical evidence on the relationship between financial depth and growth points clearly to a positive role in the economic development process. There is strong evidence that deeper and more efficient financial systems help increase growth and reduce poverty and income inequality. While an exhaustive survey of the literature is beyond the scope of this chapter, some of the most relevant findings are outlined below (drawn largely from Beck and Mooney 2021).

6.2.1. *Growth Performance*

An expansive literature has documented a positive relationship between financial and economic development—particularly with respect to incomes.

Specifically, countries with higher levels of financial development (as measured by private credit as a proportion of GDP) experience higher per capita income growth rates over the long run.[3] This relationship holds even after controlling for reverse causation (i.e., faster-growing economies having a higher demand for financial services) and other factors driving both financial development and growth. The positive relationship between financial and economic development is strongest among middle-income countries (Rioja and Valev 2004a, 2004b).

The positive impact of financial development on output growth comes mainly through more effective resource allocation and higher productivity growth, rather than through capital accumulation, and more through enterprise credit than household credit.[4] This is confirmed by an expansive literature using micro data that show that financial deepening has positive effects on firm-level innovation and entrepreneurship, with a disproportionally beneficial effect for small and medium-sized enterprises (SMEs).[5]

6.2.2. *Job Creation*

There is increasingly significant evidence that financial deepening can help create jobs. For example, at the aggregate level, Pagano and Pica (2012) show a positive and significant relationship between financial development and job creation in developing countries. For the United States, Beck, Levine, and Levkov (2010) and Benmelech, Bergman, and Seru (2021) show that branch deregulation and consequent financial liberalization led to decreases in unemployment and increased labor market participation, especially among low-skilled workers. Giné and Townsend (2004) show for Thailand that financial liberalization has contributed to the migration of subsistence agricultural workers into urban salaried jobs.

6.2.3. *Income Inequality and Poverty*

There is also increasing evidence that financial development can help reduce income inequality and poverty rates. Beck, Demirgüç-Kunt, and Levine (2007) and Clarke, Xu, and Zou (2006) show a negative relationship between financial development and income inequality, while Beck, Levine, and Levkov (2010) show a negative relationship between financial liber-

[3] See Levine, Loayza, and Beck (2000) and Beck and Levine (2004). See Popov (2018) for a survey of empirical literature.

[4] See Beck, Levine, and Loayza (2000) and Beck et al. (2008).

[5] See Ayyagari, Demirgüç-Kunt, and Maksimovic (2012), Demirgüç-Kunt, Maksimovic, and Beck (2005), and Beck et al. (2008).

alization and income inequality in the United States. Giné and Townsend (2004) and Ayyagari, Beck, and Hoseini (2020) show a negative relationship between financial development and poverty in Thailand and India, respectively. Evidence also suggests a negative association between financial development (again measured by private credit to GDP) and the growth of extreme poverty—that is, the share of the population living on less than US$1 per day. As shown by Beck, Demirgüç-Kunt, and Levine (2007), this relationship is robust to controlling for reverse causality and omitted variable bias. As in the case of finance and growth, the relationship does not necessarily come through a larger share of the population with access to credit, but rather from financial deepening resulting in labor and product market effects that positively affect the poorer segments of the population.

6.2.4. *Firm Performance*

For companies, access to finance is an important determinant of performance (Amin and Gomez 2024; Islam and Rodriguez Meza 2023). Financial resources can provide firms with a way to pay for workers and suppliers up front before sales can be realized (Chodorow-Reich 2014; Bacchetta, Benhima, and Poilly 2019); maintain inventories (Blinder and Maccini 1991; Deloof 2003; Aktas, Croci, and Petmezas 2015); advance credit to customers (Brennan, Maksimovic, and Zechner 1988; Aktas et al. 2015); and make long-term investments (Fazzari, Hubbard, and Petersen 1988; Blalock, Gertler, and Levine 2008; Levine and Warusawitharana 2021).

Global studies have also found that firms that are credit-constrained tend to be smaller. In addition, consistent with the macroeconomic evidence presented earlier, the more developed the economy, the lower the share of credit-constrained firms (Islam and Rodriguez Meza 2023).

More recently, evidence using firm-level data also suggests that there is a positive relationship between credit supply at the country level and the likelihood of having a woman as a top manager (Amin and Gomez 2024). The explanation is that women often face more hurdles than men in obtaining finance (evidence for the Caribbean is presented later in the chapter), which becomes more binding as the credit supply is limited and financial markets are less developed. It has been estimated that a unit increase in the bank-credit-to-GDP ratio increases the probability of having a woman top manager by 27 percentage points, even considering firm characteristics that could be correlated with the strategic decision of the gender of the top manager (Amin and Gomez 2024).

Finally, better access to credit help firms manage shocks, although heterogeneously—that is, the link between the two phenomena is intermediated

by additional variables (Amin and Viganola 2021; Powell and Valencia 2023). Globally, it has been found that firms with better access to finance before the COVID-19 pandemic were significantly less likely to experience a decline in sales. This was particularly true among firms that had a stronger long-standing relationship with important stakeholders such as skilled workers and input suppliers.

6.3. Financial Depth in the Caribbean in Historical and Comparative Perspective

The latest available data on the ratio of domestic private credit to GDP—the most common indicator of sector depth[6]—ranges from as high as about 74 percent for Barbados to as low as about 20 percent for Suriname and Guyana (Figure 6.2).[7] The six Caribbean countries analyzed here compare poorly with the average for both high-income and middle-income countries, which stood in 2022 at 162 percent and 132 percent, respectively.[8] The countries also fare poorly when compared to the Latin America and Caribbean average. Only Barbados has a deeper credit market than the regional average of 56 percent. Country size does not seem to be the determining factor, since the six countries are also all below the average for small states globally.

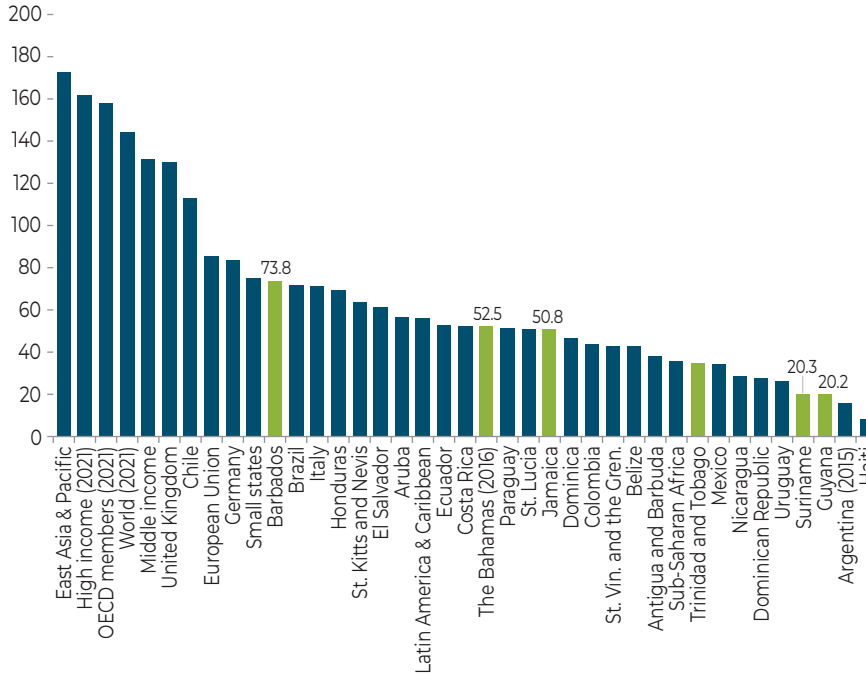
Some countries have seen the pace of deepening accelerate considerably since the 1980s, while other countries' financial sectors have remained stagnant or experienced considerable volatility in terms of credit capacity (Figure 6.3). For example, Barbados has experienced rapid private credit growth (measured as a proportion of GDP) since the 1980s. Jamaica has seen the credit market grow appreciably since about 2016, coinciding

[6] Domestic credit to the private sector refers to financial resources provided to the private sector by financial corporations—such as through loans, purchases of nonequity securities, trade credits, and other accounts receivable—that establish a claim for repayment. Financial corporations include monetary authorities and deposit money banks, as well as other financial corporations for which data are available (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other financial corporations are finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies (as defined by the World Bank's World Development Indicators database).

[7] Based on World Bank and International Monetary Fund data.

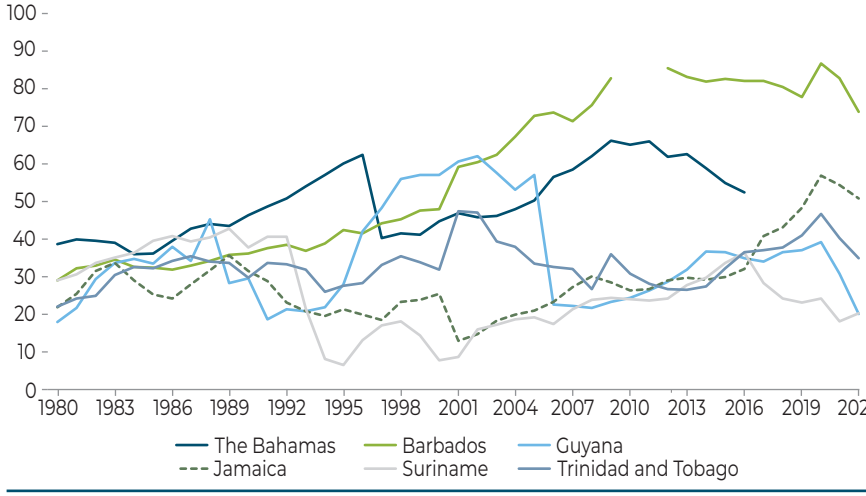
[8] Income groups are defined per the World Bank's definition. As of July 1, 2021, low-income economies are defined as those with a GNI per capita of US$1,046 or less; middle-income economies are those with a GNI per capita between US$1,046 and US$12,695; and high-income economies are those with a GNI per capita of US$12,695 or more.

Figure 6.2. Total Domestic Credit to Private Sector (Percent of GDP)



Source: World Bank, World Development Indicators database.
Note: In cases where data for 2022 were not available, the year used is indicated in parentheses. The six member countries of the IDB Caribbean Country Department are in green. OECD: Organisation for Economic Co-operation and Development.

Figure 6.3. Ratio of Private Credit to GDP, 1980–2022 (Percent)



Source: World Bank, World Development Indicators.
Note: Some data points not available for The Bahamas and Barbados.

with successful economic reforms and rapid public debt consolidation.[9] In Guyana, Trinidad and Tobago, and Suriname, market depth has oscillated significantly owing to fluctuations in both the numerator and denominator of this ratio.

6.3.1. *Sectoral Lending by Banks: Crowding In or Crowding Out?*

Though the evolution of private credit in aggregate is helpful, another important lens through which to assess credit sufficiency is to examine bank credit to the public versus private sectors. As discussed in other publications,[10] the history of public debt in the Caribbean underscores the adverse implications of outsized public borrowing for both economic stability and the availability of credit for productive private investment.

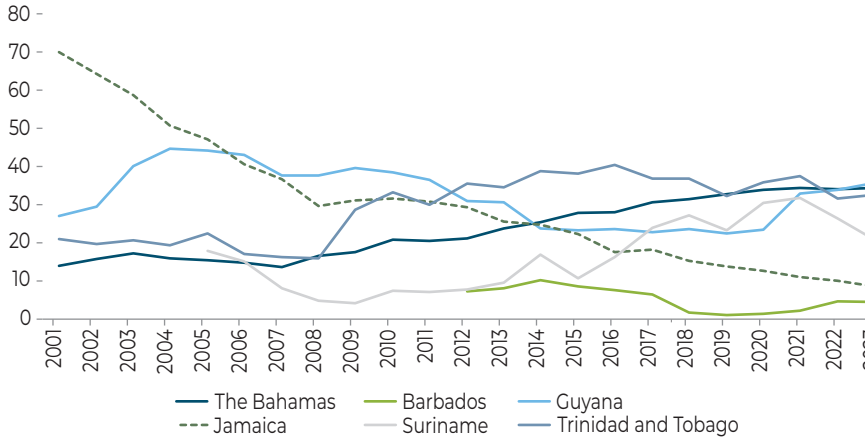
Against this backdrop, a review of the data for 2000 onward points to consequential conclusions (Figure 6.4). First, and most obviously, high or rising public debt levels drive the crowding out of private credit. For example, in Jamaica the share of domestic bank credit to the government fell from a peak of about 70 percent of all lending at the turn of the century to one of the region's lowest ratios at under 10 percent by the end of 2023. This was driven by the country's aggressive fiscal and debt consolidation program that saw it transition from the third most indebted country in the world as recently as 2013 to one of the world's most successful reformers today. The corollary of this reduction of public financing has been the aforementioned dramatic increase in credit to the private sector, more than doubling over this period (Figure 6.3).

Another issue of consequence for Caribbean countries has to do with the provision of credit by banks to the private sector, as not all private credit is created equal. In most circumstances, the benefits in terms of raising an economy's growth potential are expected to flow from private credit to entrepreneurs, businesses (particularly SMEs), and project finance (OECD 2010; Beck et al. 2012). Against this backdrop, evidence from Jamaica pre-

[9] In the case of Jamaica, high public debt forced the Jamaican government to rely on domestic markets—particularly the banking system—to meet a large share of its funding needs. Given the limited size of the domestic credit market, this heavy reliance resulted in a crowding out of private financing, as banks and other lenders allocated most of their credit capacity to the government. See Mooney (2018) for more information.

[10] For example, Mooney et al. (2022) highlight the fact that since independence in the 1960s, at least one of the six countries that are members of the IDB's Caribbean Country Department were either the most indebted or among the most indebted countries in the world.

Figure 6.4. Domestic Bank Financing of Public Sector, 2001–2023 (Percent of total domestic credit)

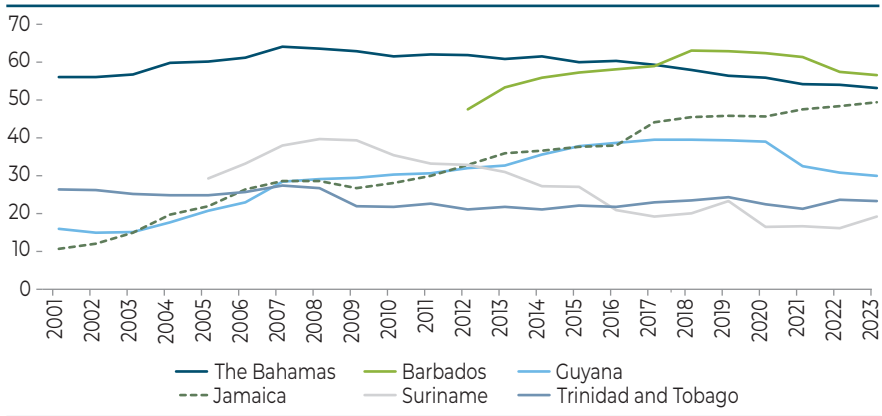


Source: Authors' calculations based on national central bank data.
Note: Total domestic credit is financing provided by commercial banks and excludes deposits with central banks and financing to non-residents (The Bahamas, Barbados, Guyana, and Jamaica). Data for Suriname include credit unions for 2006–2010, when credit unions accounted for 2 percent of all financial assets until the largest credit union became a bank in 2010, at which point their share dropped to 0.1 percent. Thus, due to capacity issues, they are no longer included. See IMF (2024).

sented by Mooney (2018) suggests that banks that had become accustomed to extending large shares of their balance sheets toward governments were not predisposed to transition quickly to more complex risk and loan assessment practices for projects and firms (especially SMEs). One consequence of this has been reliance on asset-backed lending, such as mortgages and car loans, or consumer credit and credit cards, rather than on other more potentially productivity-enhancing forms of lending. The clearest example of this has been Jamaica, where households' share of bank credit has increased fivefold since 2001, in line with declining sovereign borrowing from 11 to 49 percent in 2023 (Figure 6.5). Consumer lending also represents more than half of all bank lending in Barbados and The Bahamas, though the picture is more mixed for other countries. Regardless, ensuring that sufficient credit is available to the most productive segments of the domestic private sector will be important to drive future growth, and doing so will require avoiding crowding out wherever and whenever possible.

In summary, the effects of fiscal dominance and government domestic borrowing on private sector financial access are important considerations when assessing the evolution of credit in the Caribbean. This is true both when governments are borrowing too much—or crowding out—the private sector directly, and when there are related residual effects on bank lending practices and preferences, even when governments begin to reduce their

Figure 6.5. Domestic Bank Credit to Households, 2001–2023 (Percent of total domestic credit)



Source: Authors' calculations based on national central bank data.
Note: Total domestic credit is financing provided by commercial banks and excludes deposits with central banks and financing to non-residents (The Bahamas, Barbados, Guyana, and Jamaica). Data for Suriname include credit unions for 2006–2010, when credit unions accounted for 2 percent of all financial assets until the largest credit union became a bank in 2010, at which point their share dropped to 0.1 percent. Thus, due to capacity issues, they are no longer included. See IMF (2024).

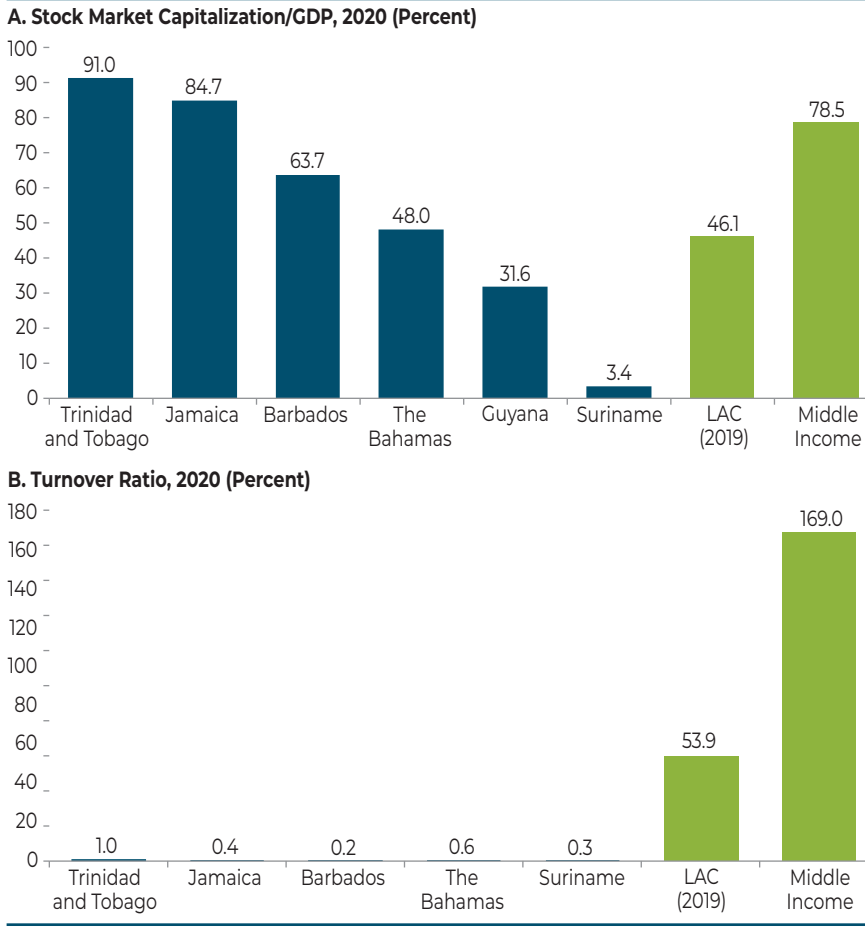
reliance on domestic credit markets. This points to the importance of both prudent fiscal management and institutions, as well as policy and regulatory measures aimed at incentivizing banks to embrace project, investment, and entrepreneurial finance—especially for SMEs and other vulnerable or marginalized groups—as viable business and lending models. Much of the rest of this chapter considers access to finance from the perspective of borrowers, particularly those from these underserved communities, and the barriers that they face, as well as policies with the potential to overcome such challenges.

6.3.2. *Financial Sector Structure and Nonbank Finance*

As discussed above, financial systems consist of different segments, often centered at their core around deposit-taking institutions and other credit providers, with public capital markets and contractual savings institutions representing more evolved segments of the system. While different segments may serve a variety of clients and purposes, their functions in terms of intermediating savings and managing risks for the economy are similar. As economies develop, the structure of the financial system also develops (Beck and Mooney 2021). At basic levels of financial development, banks dominate the financial system, focusing on payment, short-term deposit, and short-term lending services. As financial systems deepen, other segments arise, including insurance companies and other private nonbank intermediaries. At a later stage, public equity and debt markets develop.

This sequencing has also been observed in the Caribbean countries, to varying degrees. All six countries analyzed here have stock exchanges of reasonable size relative to GDP (Figure 6.6, panel A), though they are highly concentrated in terms of the number of issuing firms, and they tend to be illiquid. In other words, market capitalization (value of all outstanding shares) relative to GDP tends to be relatively high, while turnover ratios (trading volume relative to market capitalization) are very small (in the single digits) relative to regional or middle-income country averages (Figure 6.6, panel B). In 2020,

Figure 6.6. Stock Exchanges in the Caribbean versus Latin America and Middle-Income Average



Sources: Latest available data from World Bank, World Development Indicators databases and country sources.
Note: LAC: Latin America and the Caribbean. Turnover Ratio: the total value of shares traded during the year divided by the average market capitalization for the year. Average market capitalization is calculated as the average of the end-of-year values for the current year and the previous year.

stock market capitalization in Trinidad and Tobago (91 percent of GDP), Jamaica (85 percent), Barbados (64 percent), and The Bahamas (48 percent) compared well with the Latin American and Caribbean average.

6.4. Are Firms Credit-Constrained in the Caribbean?

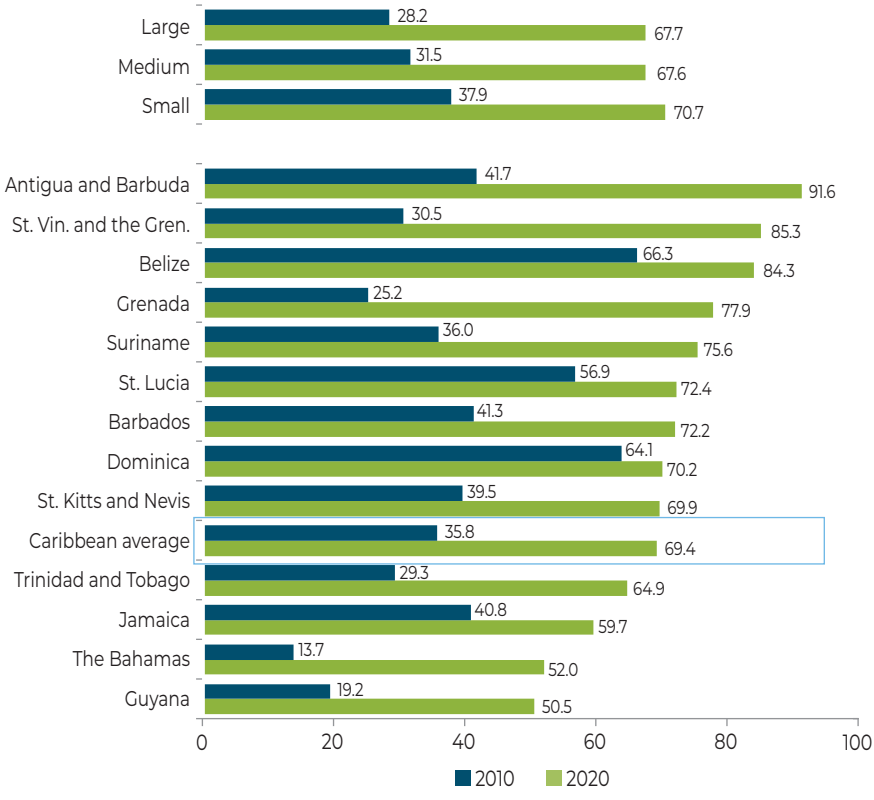
The IFPG Survey conducted from June to November 2020 included interviews with a random sample of 1,979 formal firms in 13 Caribbean countries. The aim was to gather comparable firm-level data on innovation, use of digital technologies, firm performance, gender, and business management practices. Firms in the final sample were selected using a stratified random sample representative at the country level. The following sections of the chapter focus on IFPG data, but the analysis is complemented, whenever possible, with previous rounds of firm-level data, such as the 2010 World Bank Enterprise Surveys (WBES) and the 2014 Productivity, Technology, and Innovation (PROTEqIN) Survey.

Ruprah and Sierra (2016) presented the most common concerns of Caribbean businesspersons using 2010 WBES data and provided evidence showing that these concerns are correlated with objective indicators. After ranking the obstacles to businesses' operations, the analysis shows that access to finance was the second greatest obstacle, followed closely by an inadequately educated workforce.[11] The authors found that the only Caribbean countries whose firms had a relatively less harsh perception about access to finance than the rest of small economies of the world were The Bahamas and Guyana.

The IFPG initiative included most of the 2010 subjective questions regarding obstacles to business operations and expanded the potential obstacles to include access to digital payments. The ranking of business obstacles using 2020 data was presented in Chapter 3, but Figure 6.7 incorporates both the 2010 and 2020 rankings to highlight differences over time. The average proportion of Caribbean firms that see access to finance as a binding constraint for their operations almost doubled between 2010 and 2020, increasing from 35.8 to 69.4 percent. A steep increase occurred in all Caribbean countries except for Dominica, where the share of firms increased by 6 percentage points. However, the relative severity of credit access problems for small firms evidenced in Powell and Valencia (2023) using 2010 data seems to have decreased by 2020, with 70.7 percent of small firms perceiving access to credit as a major constraint compared to 67.7 percent of medium-size and large firms.

[11] See Chapter 4 in Ruprah and Sierra (2016) for a thorough review of different complaints by business owners and their correlation with objective measurements.

Figure 6.7. Access to Finance as a Major Constraint, 2010 and 2020 (Percent)

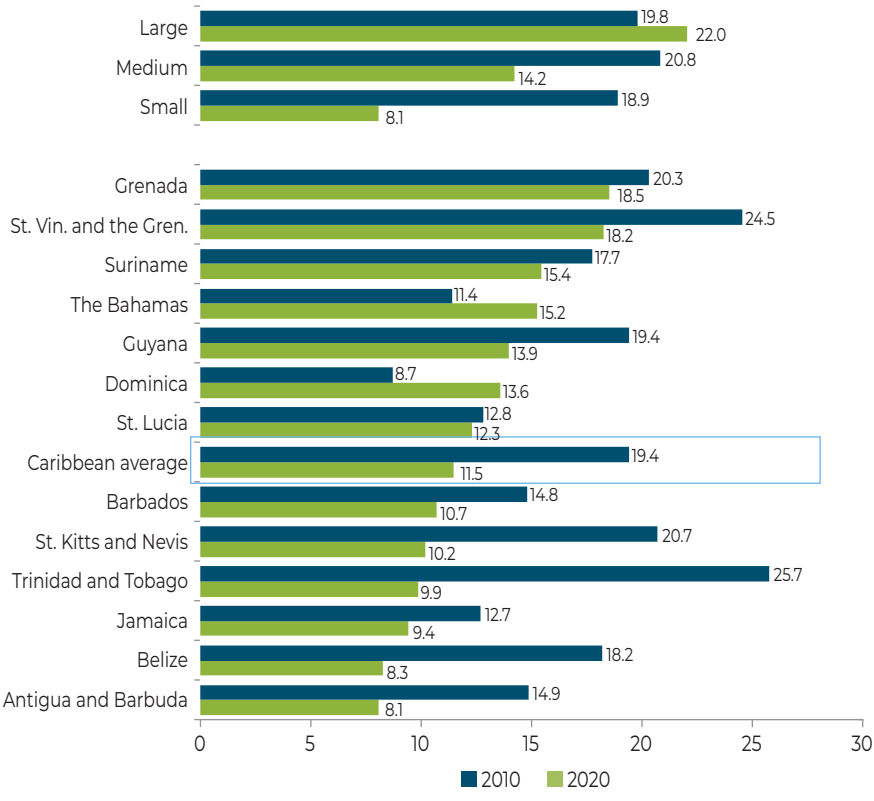


Source: Prepared by the authors based on Innovation, Firm Performance, and Gender Survey data.

One hypothesis behind the overall worsening of the access to finance valuation is that firms were just experiencing the short-term effects of the COVID-19 pandemic during IFPG data collection. This could have negatively affected firms' perceptions about accessing capital to deal with any potential effects of the pandemic in the short run. On the other hand, objective aggregate indicators related to access to finance could have worsened in the Caribbean during this 10-year span. Regardless of the factors behind the worsening of the subjective indicators about access to finance, there is no doubt that it has been cited consistently as one of the main obstacles to firm performance (Ayyagari, Demirgüç-Kunt, and Maksimovic 2012).

Informal financial systems have played a role in providing access to finance to firms that are disadvantaged in formal credit markets. However, these systems have been shown to be less efficient than formal channels in promoting firm growth. Powell and Valencia (2023) showed that the Caribbean relies more than other regions on banks to finance working cap-

Figure 6.8. Proportion of Working Capital Financed by Banks, 2010 and 2020 (Percent)



Source: Prepared by the authors based on Innovation, Firm Performance, and Gender Survey data.

ital though with a high variance between countries. Figure 6.8 shows this variance and also how the overall proportion decreased over time. The Bahamas and Dominica are the only countries in the Caribbean for which the proportion of working capital financed by banks increased between 2010 and 2020. Furthermore, the regional average of 16 percent presented in Powell and Valencia (2023) was driven *upward* by countries from Latin America (like Chile and Peru). The present study finds that this average decreases to 11.5 percent when restricting the analysis to Caribbean countries.

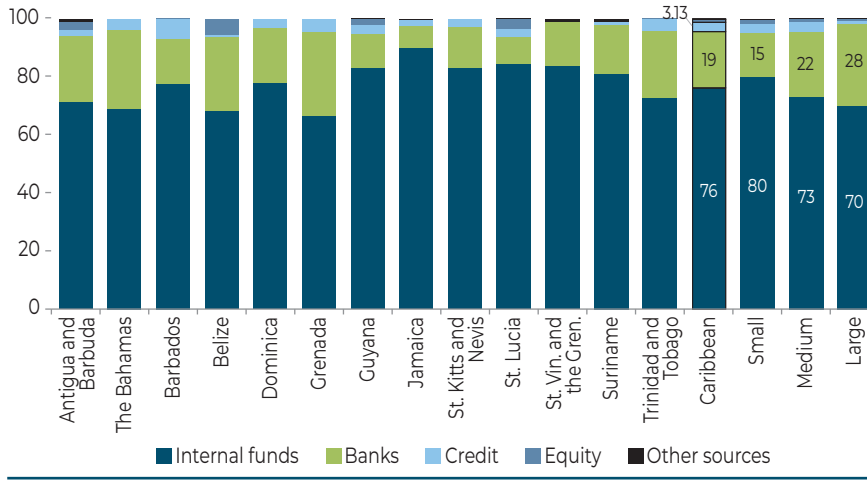
The differences in terms of size widened over time. The difference between small and large firms' proportion of working capital financed by banks was less than 1 percentage point in 2010. This gap widened by 2020, when large firms had a proportion of such working capital almost three times that for small firms. This suggests that any shocks to the financial system will affect firms differently, and policies aimed at improving bank

liquidity to offer attractive financing solutions for smaller firms will likely improve their investment plans.

If small firms do not fund their working capital by borrowing from private commercial banks, what are the most common sources of finance in the Caribbean? Similar to the results from Powell and Valencia (2023), the present study finds that the importance of banks for funding investment in the Caribbean increases with firm size: 15 percent of investments for small firms are funded through private commercial banks, compared to 28 percent for large firms. Nonetheless, internal funds (or retained earnings) are the most widely used sources of funding in the Caribbean. On average, three-quarters of investments in the Caribbean are financed with the firm's internal funds, followed by banks, with 19 percent. Grenada and The Bahamas have the highest shares of investment financing from banks, at 28.7 and 27.2 percent, respectively.

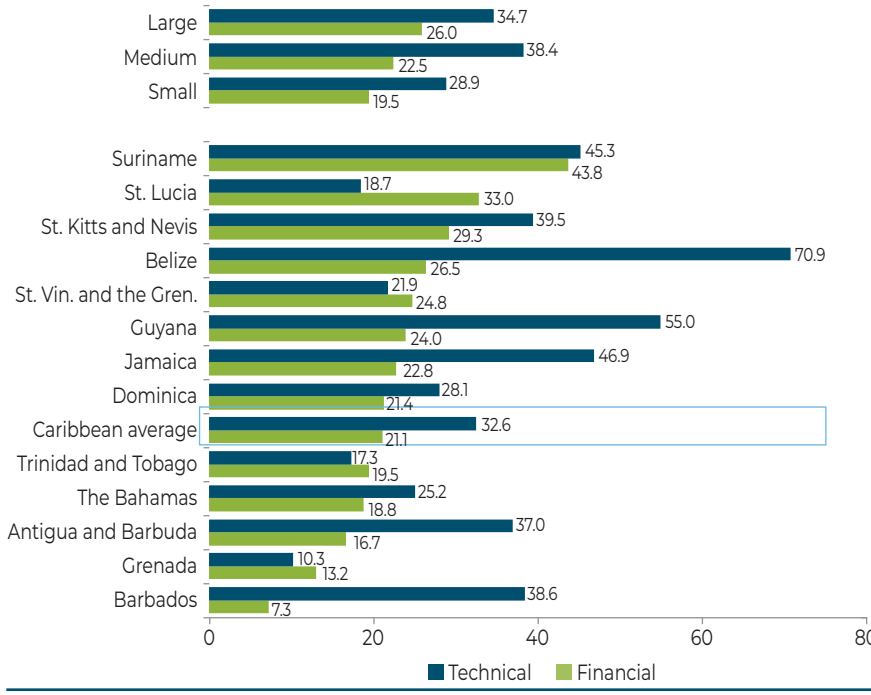
Relying heavily on internal funds for investments translates into greater financial independence and could insulate firms from undesired external market fluctuations. However, it could also lead to underinvestment, risk concentration, and higher pressure on the firms' reserves. EBRD, EIB, and World Bank (2016) focused on firms from the Middle East and North Africa (MENA) and showed they tend to exclude themselves from financial markets at the cost of losing growth opportunities. Other sources of investment funding are very scarce in the Caribbean: supplier credit is ranked third as a source of investment financing, with an average of 3.1 percent. The use of equity and other sources of funding is negligible (Figure 6.9).

Figure 6.9. Sources of Investment Funding (Percent)



Source: Prepared by the authors based on Innovation, Firm Performance, and Gender Survey data.

Figure 6.10. Proportion of Firms Seeking Technical or Financial Assistance (Percent)



Source: Prepared by the authors based on Innovation, Firm Performance, and Gender Survey data.

As explained in detail in Chapter 2, the COVID-19 pandemic had a pronounced and negative impact on overall economic activity in the Caribbean. Travel restrictions, lockdowns, and an overall decline in global tourism made the region more vulnerable to the adverse effects of the pandemic. The innovation efforts of Caribbean firms changed dramatically, and their labor force composition shifted to protect women's jobs. However, the need for financial assistance to ramp up firm activities in the aftermath of the COVID-19 pandemic was lower than that of technical assistance. Acevedo et al. (2021) found that 34 percent of firms said they needed technical assistance after the pandemic, mostly in the form of digitalization and online production training programs for employees, and network programs to develop new foreign markets or new clients.[12] The greater need for technical assistance is evidenced in Figure 6.10 and it is mainly driven by the relatively higher demand for technical assistance in Belize, Guyana, Jamaica, and Suriname. The latter country

[12] Although the authors use IFPG data for their analysis, they restricted the sample to seven countries (1,153 firms) rather than the complete sample of 1,979 firms from 13 Caribbean countries used throughout this book.

has the largest proportion of firms that have needed financial assistance after COVID-19, at 43.8 percent, compared to only 7.3 percent in Barbados, which confirms the considerable variation across countries in the Caribbean.

To complete the picture of access to credit among Caribbean firms, the analysis here follows Kuntchev et al. (2013) to properly classify firms using a slight variation of their credit-constrained status classification. The main sources of information remain the same: (i) external sources of finance for working capital and investments and (ii) loan applications during the previous fiscal year (and the reasons for not applying or being rejected). As in EBRD, EIB, and World Bank (2016), firms are classified into three main categories: fully credit-constrained, partially credit-constrained, and not credit-constrained. Credit-constrained firms are defined as those that are either partially or fully constrained. However, firms are allowed to be classified as partially credit-constrained based on the firm's application for a loan (partially approved) even if they did not use external sources of finance for their working capital. The same intuition holds for classifying firms as not credit-constrained if they did not use external sources of investment finance but were fully approved in a loan application.[13] The credit-constrained classification is detailed below (and also illustrated in Figure 6.11):

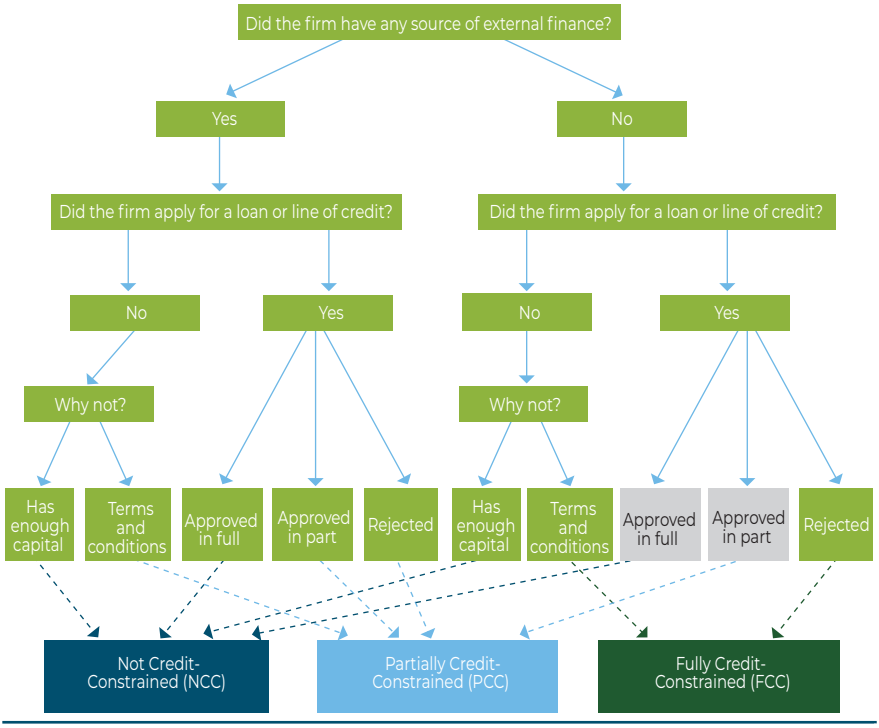
- **Fully credit-constrained firms:**
  - Did not use external sources of finance for working capital and investments in the previous fiscal year.
  - Applied for a loan during the previous year and the loan were rejected, or did not apply for a loan during the previous year for reasons other than having enough capital for the firm's needs (hence, they were rationed out of the market).
- **Partially credit-constrained firms:**
  - Used external sources of finance for working capital and investments in the previous fiscal year, and either:
    - Did not apply for a loan during the previous year, for reasons other than having enough capital for the firm's needs (and hence were rationed out of the market), or
    - Applied for a loan but were rejected or only partially approved.
  - Did not use external sources of finance for working capital and investments in the previous fiscal year but were partially approved for a loan or line of credit.

[13] These slight modifications are clearly marked as grey rectangles with dotted arrows in Figure 6.11.

- **Not credit-constrained firms:**
  - Did not apply for a loan during the previous year because they have enough capital for the firm's needs.
  - Applied for and were fully approved for a loan.
  - Were fully approved for a loan or line of credit even if they had no external source of investment finance.

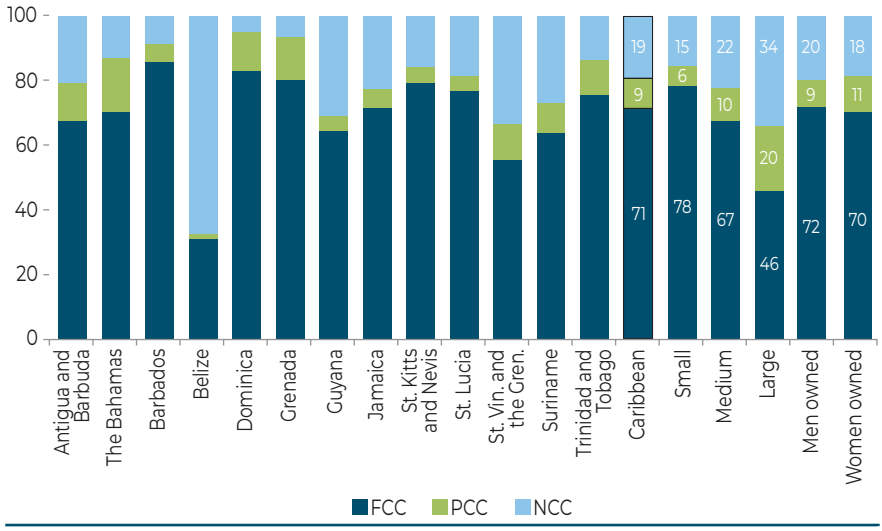
It is worth noting how this specific credit classification yields a distribution that is heavily tilted toward fully credit-constrained firms. This is mainly due to two factors: external sources of investment financing, which are very scarce in the Caribbean, and the terms and conditions imposed for loan applications, which are such that firms are heavily discouraged from applying for loans. The lack of external financing was already illustrated in Figure 6.9. Caribbean firms rely heavily on internal funds and rarely use loans from banks or nonbank financial institutions. Only 12.9 percent of Caribbean firms used external sources to finance their working capital, so 87.1 percent of the sample can be traced to the right ("No") of Figure 6.11.

Figure 6.11. Credit-Constrained Classification



Source: Prepared by the authors.

Figure 6.12. Credit-Constrained Classification of Caribbean Firms (Percent)



Source: Prepared by the authors based on Innovation, Firm Performance, and Gender Survey data.
Note: FCC: fully credit-constrained, PCC: partially credit-constrained, NCC: not credit-constrained.

In the Caribbean, 71 percent of firms are classified as being fully credit-constrained (Figure 6.12). This result contrasts dramatically with that for the MENA region in EBRD, EIB, and World Bank (2016), where the average was approximately 13 percent. Moreover, 73 percent of firms in MENA were not credit-constrained, compared to only 19.4 percent in the Caribbean. The only Caribbean country with a credit-constrained classification similar to the MENA distribution is Belize, with the proportions of not credit-constrained, partially credit-constrained, and fully credit-constrained at 67.4, 1.7, and 30.8 percent, respectively.[14]

Kuntchev et al. (2013) found that SMEs are more likely to be credit-constrained than large firms and that the probability of being credit-constrained decreases with firm size. While the present study did not use regression analysis for the determinants of being credit-constrained, the descriptive results on credit classification and firm size are consistent with those of Kuntchev et al. (2013): 78 percent of small firms in the Caribbean are credit-constrained, compared to 45 percent of large firms. In contrast, 33 percent of large firms are not credit-constrained versus 15.3 percent of small firms.

[14] When analyzing the underlying factors of the classification, it can be seen that having enough capital is the driving force behind Belize's overperformance. In the rest of the Caribbean, 16.3 percent of firms stated that the reason for not applying for a loan was because they did not need it (establishment has sufficient capital), but the share of firms in Belize giving this reason for not applying was 66 percent.

Table 6.1. Credit-Constrained Classification and Performance of Caribbean Firms

	Sales per Worker (U.S. dollars)	Sales Growth (percent)	TFP
NCC	72,313.5	15.67	3.36
PCC	71,259.6	7.29	2.68
FCC	50,001.3	8.81	2.76
Average Caribbean	**55,940.4**	**9.84**	**2.85**

Source: Prepared by the authors based on Innovation, Firm Performance, and Gender Survey data.
Note: NCC: not credit-constrained, PCC: partially credit-constrained, FCC: fully credit-constrained. TFP: total factor productivity.

At first, differences in the credit-constrained classification with respect to gender seem minor. The next section will provide an in-depth analysis about women-led companies and firms' credit constraints.

The relationship between firms' credit-constrained classification and their performance is aligned with the results from Islam and Rodriguez Mesa (2023) in that credit-constrained firms are negatively correlated with labor productivity and sales growth. Furthermore, total factor productivity (TFP) is also higher for not credit-constrained firms compared to either partially or fully constrained firms. Table 6.1 shows these performance metrics with respect to the credit classification described in this chapter. While TFP and sales growth for the average partially credit-constrained firm is slightly lower than for the average fully credit-constrained firms, both metrics are significantly lower than for those firms that are classified as not credit-constrained. Sales per worker, on the other hand, do not differ much between not credit-constrained and partially credit-constrained firms, but being a fully credit-constrained firm is associated with sales per worker that are, on average, US$20,000 lower (Table 6.1).

6.4.1. *Financial Constraints Have Worsened for Caribbean Firms in the Last Decade*

This section exploits the panel nature of the IFPG and PROTEqIN datasets to analyze the financial constraints of Caribbean firms over time. This analytical exercise allows for better understanding the firms' credit constraints by looking at changes at the firm level instead of relying on the analysis of repeated cross-sections.[15] The sample is restricted to those firms that were

[15] This type of analysis comes at a price in terms of the sample size. While the complete samples of the IFPG and PROTEqIN Surveys included 1,979 and 1,966 firms, respectively, the panel sample is restricted to 366 firms.

Table 6.2. Credit-Constrained Classification Transition Matrix for Caribbean Firms, 2014 to 2020 (Percent)

	NCC 2020	PCC 2020	FCC 2020
NCC 2014	32.46	12.28	55.26
PCC 2014	26.15	13.85	60
FCC 2014	20.35	9.88	69.77

Source: Prepared by the authors based on the 2014 Productivity, Technology, and Innovation Survey and the 2020 Innovation, Firm Performance, and Gender Survey.
Note: NCC: not credit-constrained, PCC: partially credit-constrained, FCC: fully credit-constrained.

included in the WBES, PROTEqIN, and IFPG rounds of data collection, reaching a balanced panel of 702 firm-year observations.

The main variable of interest exploited for the analysis is the credit-constrained classification described above. However, due to slight changes in the PROTEqIN Survey questionnaire, we were not able to classify all the 2014 firms in the sample,[16] so transition matrices are calculated for the credit-constrained classification. These matrices describe the transition of firms between different categories (fully, partially, or not credit-constrained) from 2014 to 2020 in a dynamic system. The results presented in Table 6.2 show a clear deterioration in both the use of external finance for investments and the outcomes of loan applications in the Caribbean. This deterioration is reflected in a larger proportion of firms transitioning toward being fully credit-constrained by 2020. Among the total number of fully credit-constrained firms in 2014, nearly 70 percent remained fully constrained in 2020, 10 percent became partially constrained, and only 20 percent made progress by transitioning to not credit-constrained status. By contrast, an analysis of firms that were not credit-constrained in 2014 (first row of Table 6.2) found that only a third retained that status, 12.3 percent moved to being partially credit-constrained, and an alarming 55 percent transitioned to fully credit-constrained.

6.4.2. *Differences by Firm Size*

While Table 6.2 shows a deterioration in access to credit among Caribbean firms (the demand side) during the last decade, Table 6.3 shows notable dif-

[16] The PROTEqIN dataset asked about sources of external financing and loan applications for all firms. However, many firms declined to answer the question about sources of financing for fixed assets. Hence a total of 103 firms were not classified in the 2014 PROTEqIN Survey. Among these 103 firms, only 15 corresponded to the panel sample, so the transition matrices presented in this section are based on 351 firms (i.e., 702 firm-year observations) rather than 366.

Table 6.3. Credit Constraints and Firm Size in the Caribbean, 2014 and 2020 (Percent)

Small			
	NCC 2020	PCC 2020	FCC 2020
NCC 2014	21.28	8.51	70.21
PCC 2014	18.18	15.15	66.67
FCC 2014	12.33	8.22	79.45

Medium			
	NCC 2020	PCC 2020	FCC 2020
NCC 2014	32.43	13.51	54.05
PCC 2014	22.73	13.64	63.64
FCC 2014	18.75	10.94	70.31

Large			
	NCC 2020	PCC 2020	FCC 2020
NCC 2014	33.33	22.22	44.44
PCC 2014	66.67	33.33	0
FCC 2014	41.67	25	33.33

Source: Prepared by the authors based on data from the 2014 Productivity, Technology, and Innovation Survey and the 2020 Innovation, Firm Performance, and Gender Survey.
Note: NCC: not credit-constrained; PCC: partially credit-constrained; FCC: fully credit-constrained.

ferences in credit classification when disaggregating by firm size. There is substantial empirical evidence that small firms have less access to formal sources of external finance, which could potentially explain their underperformance and lagging contribution to economic growth. Hence, transition probability matrices are used for each firm size category.[17]

6.5. Constraints Based on Gender: Are Companies Led by Women More Credit-Constrained Than Those Led by Men?

Evidence from different studies point to credit rationing being more prevalent among firms where women play a key role in the strategic decisions of the company.[18] This evidence holds true in the Caribbean, as in other regions of the world.

In most Caribbean countries, more than half of women-owned or women-led companies reported that financial costs, such as interest rates and/

[17] As explained earlier, the overall panel sample size for this analysis is small, consisting of only 351 Caribbean firms. The results presented for each size category should thus be considered indicative and taken with caution.

[18] There is overwhelming evidence that there is gender discrimination in the credit market throughout the developing world, and that this discrimination yields lower levels of credit for women, as well as worse credit conditions. See, for example, Montoya et al. (2020).

or collateral, were either a major or a very severe obstacle to growth. However, there is heterogeneity within the region. The countries where more women-owned or women-led companies cite the cost of finance as a major obstacle to business (relative to other firms) are Jamaica (10 percentage point difference in the proportion of companies that cite cost of finance as a major obstacle), and Guyana (9 percentage point difference) (Mooney et al. 2022).

Objective metrics support these claims. Over the last 20 years, women-owned or women-led companies have reported that they accessed approximately 20 percent of the volume of all short-term credit granted, defined as loans with maturity of less than three years,[19] and only 1.3 percent of medium-to-long-term loans (by volume) (Mooney et al. 2022).

The average loan size given to women-owned or women-led companies is much smaller than that provided to other companies. On average, these loans are about one-tenth the value (US$156,178) of those given to other firms (US$1.54 million). This cannot be explained by differences in the size of the companies alone, given that the average women-owned or women-led firm is half the size of the rest of the companies.

There could be important factors limiting access to loans for women-owned or women-led firms beyond the interest rate. In fact, in some of countries where more of these companies cited access to finance as a major obstacle (Barbados and Suriname), the cost of finance is a less-prevalent obstacle relative to other firms. For example, 76 percent of women-owned or women-led firms in Barbados cite access to finance as a barrier, but only 36 percent cite the cost of finance as a barrier.

This suggests, on the one hand, that the structure and terms of loans (e.g., tenor), the ability to secure enough collateral, or a lack of business capacity could be factors contributing to limiting the ability to successfully apply for and obtain business loans. Trinidad and Tobago is a separate case—while its overall reported prevalence for the cost of finance as a barrier is very close to other firms (41 percent), 37 percent of women-led or -owned firms diagnose this barrier as very severe—the highest proportion in the region.

On the other hand, there seem to be factors beyond the firms themselves that could limit access to loans by women-owned or women-led firms. Statistical analysis reveals that these firms are 5 percentage points more likely to identify access to finance as a major constraint for business than men-managed firms, even when size, age of the firm, economic activity, and location of the company are accounted for (Powell and Valencia 2023).[20]

[19] The IFPG Survey for the Caribbean collected information from more than 1,153 firms.

[20] The sample consists of almost 2,000 firms, and control variables include firm size, the log of firm age, and sector and country fixed effects. Among both men- and

6.6. Why Are Firms Credit-Constrained? Some Contributing Factors

This section describes some common structural supply factors that influence the intermediation of financial resources toward Caribbean firms. As noted above, a key factor is the limited availability of capital beyond direct forms of credit. In most countries, capital markets (e.g., equity and bond markets) are not sufficiently deep or liquid options for the private sector, which drives businesses to traditional banks that offer a narrow set of options, particularly in terms of loan terms and repayment schedules. As also noted above, within the banking sector, there is a dependence on traditional and less complex financing mechanisms—for example, credit to governments or asset-backed lending, including mortgages—over corporate, entrepreneurial, or project finance, particularly for SMEs.

As also discussed earlier, high public debt levels and government borrowing—that is, fiscal dominance—displace private borrowing and increase local financing costs, crowding out private investment. The existing economic structure of Caribbean countries makes lending in emerging or nontraditional sectors more costly for banks, as information on newer activities is scarcer and there is in general more risk aversion regarding these sectors. For example, in the case of Trinidad and Tobago, firms in sectors outside of the energy sector systematically face more credit constraints than companies associated with that sector. In The Bahamas, a limited network of credit unions predominantly linked to the tourism sector and with a low penetration rate among the economically active population prevents larger access to private financial resources.

Institutional and regulatory environments could be improved to facilitate better access to financial resources by firms. These include institutional and regulatory reforms and incentives to help develop the corporate debt market; support for increased coverage of public pension systems to expand assets under management and the supply of resources for investments in the productive sector; and the development of centralized credit bureaus (i.e., Barbados) to help reduce information asymmetries.

Another common supply-side obstacle to firms' access to finance is the fragmentation and lack of coordination among key ecosystem enablers for

women-managed firms, 71 percent report access to finance as a major constraint in this sample. For more information on the survey and the impact of the COVID-19 pandemic on Caribbean firms, see Acevedo et al. (2021). This evidence is in line with previous studies of the Caribbean (Piras, Presbitero, and Rabellotti 2013) as well as in the context of European developing countries (Stefani and Vacca 2013).

startups. This is observed in some countries with overlapping initiatives, limited coordination, and business advisory services that make little to no differentiation in terms of the business model, stage, or lifecycle of the firms. In addition, startup ecosystems are increasingly focusing on technology-driven sectors across the region, which traditionally face high risk aversion in the banking system and limited funding from venture capitalists and angel investors.

Finally, the underdevelopment of capital markets in Caribbean countries limits startups' access to alternative funding sources. It also affects the return on investment of early-stage venture capitalists and angel investors, as they currently need a way to exit the investment publicly. The presence of institutional investors with long-term perspectives could enhance capital market expansion, but this requires the right market incentives, particularly for developing a debt market.

The venture capital landscape in the Caribbean is still in its early stages of development. Though evolving at varying speeds and levels of coverage, it is not yet substantial or mature enough to meet the financial needs of micro, small and medium-sized enterprises. While there have been government-created initiatives across the Caribbean to address some of these financing gaps, the demand for funds substantially exceeds supply, and the reach of these initiatives remains narrow.[21]

6.7. Access to Credit Can Unlock Green Investments, including for Greater Energy Efficiency

While large corporations play an outsized role in driving global climate change, firms of all sizes have a carbon footprint and can play a role in supporting greater environmental sustainability. Access to finance can be key to facilitate the adoption of green technologies and sustainable practices by firms.

Around 50 percent of surveyed Caribbean firms have made at least one type of green investment. Green investments identified in the IFPG Survey include (i) reduced material use per unit of output; (ii) reduced energy use per unit of output; (iii) reduced CO_2 footprint (total CO_2 production); (iv) replacement of materials with less-polluting or less-hazardous substi-

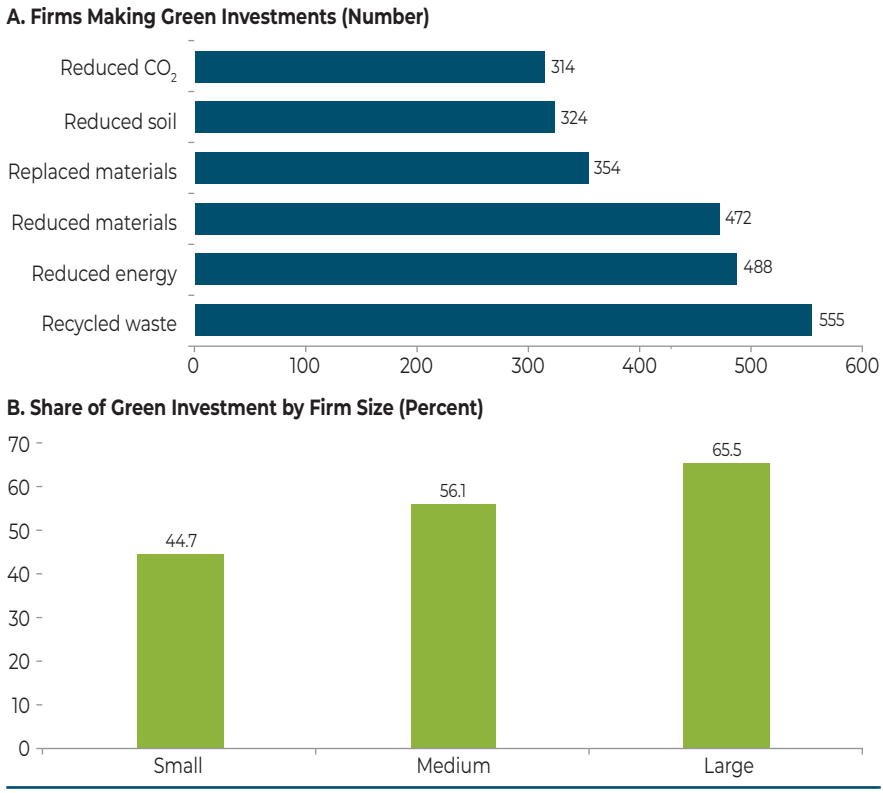
[21] According to publicly available data, the Bahamas Entrepreneurial Venture Fund Ltd has funded around US$8.2 million in initiatives since its inception in 2005, with 80 percent in Nassau, 12 percent in Grand Bahama, and the rest dispersed among the Family Islands. Similarly, the Jamaica Venture Capital Programme (JVCapital), established in 2013, has raised over US$450 million and invested in 21 Jamaican businesses. The Venture Capital Equity Fund Limited (VCEFL) in Trinidad and Tobago had US$12.4 million in its 2021 portfolio.

tutes; (v) reduced soil, water, noise, or air pollution; and (vi) recycled waste, water, or materials.

Recycling (waste, water, or materials) is the most common type of green investment (Figure 6.13, panel A). In addition, becoming more efficient through reduced energy use per unit of output and material use per unit of output are a prevalent focus. Size is associated with green investments, as larger firms are more likely to be green innovators than SMEs. Indeed, while 65 percent of large firms are green innovators, only about 50 percent of SMEs are also green innovators (Figure 6.13, panel B).

Energy efficiency is one of the ways firms can take action to combat climate change. Data on energy intensity for firms, measured as the ratio between the value of energy consumption and the value of sales, shows that Caribbean countries have the highest levels among all Latin American and Caribbean countries, with wholesale and retail as well as tourism

Figure 6.13. Green Investment by Caribbean Firms



Source: Prepared by the authors based on Innovation, Firm Performance, and Gender Survey data.
Note: Panel A shows the number of firms adopting each type of green innovation mentioned. Firms may invest in more than one innovation.

sectors making an important contribution (Aparicio, Pereira, and Yañez-Pagans 2022).

To date, firms have been slow to adopt energy efficiency measures due to both financial constraints and a lack of knowledge about these technologies and the technical capabilities to implement them, among other barriers (Gillingham and Palmer 2014; Allcott and Taubinsky 2015). Regression analyses for the Latin America region, including Caribbean countries, show that being credit-constrained is associated with a decrease in energy efficiency and that solving the issue of credit access may be more important among larger firms, in this case given that the energy efficiency gap between credit-constrained and not credit-constrained large firms is more substantial than the gap among smaller firms (Aparicio, Pereira, and Yañez-Pagans 2022).

More broadly, estimates using the IFPG Survey and the credit-constrained classification described earlier show a clear pattern: firms not constrained by credit are 16 percent more likely to be green innovators. After additional controls are included, the coefficient remains statistically significant despite a magnitude reduction. For instance, when controlling for firm size, export activities, foreign ownership, and firm age, the likelihood declines to 8.5 percent. However, the results consistently maintain statistical significance at the 99 percent confidence level, underscoring the robust relationship between financial access and green innovation investments. When this is broken down further and each of the separate green innovation channels is analyzed, all the results retain statistical significance and are consistent with the broader results. However, the bigger impact is seen by those firms that reduced the energy used per unit of output, reduced their CO_2 footprint, or recycled waste, water, or materials.

Greater adoption of energy efficiency practices as well as other climate-smart investments by firms has the potential to be supported by sustainable debt markets. In past years, the Latin America and the Caribbean region has seen an exponential increase in the emission of green, sustainability, and sustainability-linked bonds by public and private financial institutions. Corporations have also used these instruments to attract investments and support their climate transition. Despite the progress, the Caribbean still lags in the emission of these types of bonds. According to data from the Climate Bonds Initiative (CBI), the cumulative amount of green, sustainability, and sustainability-linked bonds issued between 2014 and 2022 in Latin America and the Caribbean was US$123.3 billion, but the Caribbean accounted for only 0.07 percent of this total. Barbados was the only country where a green bond and a sustainability bond were issued (CBI 2023).[22]

[22] The green bond in Barbados corresponds to a nonfinancial corporate bond and the sustainability bond is a sovereign issuance.

Access to finance can also play a critical role in helping firms autonomously strengthen their adaptation and resilience to climate change. Savings, lending, and insurance solutions, among other factors, can help firms prepare for, cope with, and recover from increasingly intense and unpredictable climate shocks. Zetterli (2023) conducted more than 100 interviews with financial services providers and found that few offered or were trying to develop solutions designed to adapt to climate change and strengthen resilience. Among the reasons where a poor understanding of client needs, lack of data, and weak organizational capacity for climate change. Many also raised questions about the business case, as adaptation investments can be hard to value, have lengthy time horizons, and often do not generate revenue that can be put toward loan repayments.

6.8. Conclusions and Options for the Future

Research and data detailed in this chapter point to several important observations and conclusions regarding financial sector development and access to credit in the Caribbean. First, economic structures, macroeconomic conditions, and policies have contributed to a history of economic volatility and fiscal dominance, which have crowded out private investment. Second, capital markets in these countries tend to be underdeveloped and illiquid, forcing firms and others to rely on credit markets that remain less than adequate and are constrained by structural factors. Third, the ecosystems for entrepreneurs and early-stage companies—for example, incubators, related credit facilities, and venture capital—are less advanced or available in the Caribbean than in many other regions. Fourth, a key constraint to financing seems to be the availability of credit risk analyses and information on credit histories, which makes lending more complex and uncertain for those considering loan proposals. This is also consequential for vulnerable or marginalized groups, including women, as evidence suggests that a lack of credit information tends to increase the incidence of biases affecting lending decisions.[23] Fifth, data and analyses suggest that most firms and their growth objectives are hindered by this relative lack of access to credit, though to varying degrees. Importantly, smaller firms, and particularly those owned or operated by women, tend to face significantly more

[23] For instance, Montoya et al. (2020) find that loan requests by women in Chile are 18 percent less likely to be approved than those by men. Also, Brock and De Hass (2019) implemented a lab-in-the-field experiment in Turkey showing that credit officers were 30 percent more likely to require a guarantor when the loan applicant was a woman. This bias was found to be driven by young and inexperienced loan officers and by applications corresponding to women in men-dominated sectors.

severe barriers to accessing credit than larger enterprises and those owned or operated by men. In addition, firms with the benefit of greater access to finance have been in stronger positions to make more significant investments in green and sustainable activities that have proven beneficial to the enterprises themselves, as well as to the economies and environments in which they operate.

Beyond these and related conclusions, this chapter also examined several key areas where reforms, policies, and other initiatives can make a difference. Some measures are straightforward and well understood. Others involve new and innovative approaches that are beginning to prove successful in other countries and provide promising new avenues for the region. While a detailed examination of all possible approaches is beyond the scope of this volume, a few are important and relevant enough to warrant emphasizing here.

First, economic stability and fiscal sustainability are prerequisites for faster and more inclusive financial sector development. Second, governments and regulators must create incentives and regulatory environments that encourage credit providers to move beyond government and asset-backed finance to embrace the financing of smaller firms and productivity-enhancing project and entrepreneurial lending. This includes women-owned and women-led enterprises. Similarly, investing in technology and other means of improving credit risk information will be critical to unlocking more finance—for example, psychometric tests that can predict an individual's repayment behavior (Arráiz, Bruhn, and Stucchi 2017), or tests based on individuals' digital footprints, including call records and installed phone applications (Agarwal et al., forthcoming).

In addition, government and regulatory incentives to reach certain populations or to support certain types of investments have proven effective in both the Caribbean and elsewhere. This includes incentive mechanisms (financial or otherwise), or programmatic approaches, including creating enabling environments for the issuance of thematic financing instruments. A recent and promising example is the joint effort by the IDB and the Jamaica Stock Exchange to develop and launch new green, social, sustainability, and sustainability-linked bond issuance guidelines for the domestic market (Jamaica Stock Exchange 2024).

These and many other related initiatives, technologies, and policies will be important stepping stones toward a more inclusive and sustainable development path for Caribbean countries.

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7

Toward a Vibrant Private Sector in the Caribbean

Diether W. Beuermann

Conscious of the critical role that the private sector plays for sustainable and inclusive development, this volume has provided an in-depth examination of the main opportunities and challenges for the private sector in 13 Caribbean nations: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. The study is a natural follow-up to the publication entitled *Engine of Growth? The Caribbean Private Sector Needs More Than an Oil Change* (Ruprah and Sierra 2016), which documented that the Caribbean private sector underperformed comparable countries across several dimensions, including investment, sales growth, innovative capacity, and productivity.

This book has placed particular emphasis on four key determinants of business productivity and growth: the investment climate in which firms operate, the quality of human capital in local labor markets, the innovation capacity of firms, and the availability and adequacy of firm financing. The analysis uncovered significant challenges in all these areas, but it also identified critical areas where sound evidence-based policies have the potential to stimulate ecosystems that spur sustainable development.

The business environment in which the average Caribbean firm operates has several shortcomings. About a third of firms report the need to make informal payments to "get things done." This applies, for example, to obtaining import licenses or construction-related permits. Another limitation pertains to the quality of public services. About two-thirds of Caribbean firms report experiencing power or Internet outages. When considering a composite measure of the quality of the investment climate in which firms operate, the analysis in this volume shows that this matters substantially. Indeed, firms that operate within a business-friendly environment are

55 percent more productive than similar counterparts operating in relatively more adverse environments.

This evidence calls for policies to streamline processes to obtain licenses or permits. Tapping into digital and automated online services to minimize paperwork and associated waiting times could have a significant positive impact on firm performance and encourage entrepreneurship. The associated higher costs imposed by informal payments must be avoided by automating public services via digital payment systems. Implementing nationwide campaigns to promote transparency while putting in place mechanisms to report corruption (e.g., telephone hotlines) can also help reduce the incentives for such undesirable practices.

There is no doubt that the relevance and quality of the skills offered by the local workforce constitute a critical enabling factor for firm innovation, productivity, and growth. Nonetheless, the evidence unequivocally shows a skill mismatch in Caribbean labor markets. This is characterized by an oversupply of unskilled workers and a deficit of skilled ones. A significant determinant of this is the skill-biased emigration phenomenon that is fueled by significantly larger returns for the Caribbean skilled workforce abroad. The issue of skill shortages in Caribbean labor markets calls for urgent coordinated actions between the public and private sectors.

Generating a system in which potential employers and training institutions collaborate to increase productive employment through curricula design that emphasizes the most demanded skills should become a priority. In this vein, high-quality vocational training is critical to address skill shortages, including those related to information and communication technology skills. There is a need for an overarching focus on vocational training policies that govern the sector to ensure that they promote efficient governance, clarify the mandates of involved entities, install coordination mechanisms, promote engagement with the private sector, outline standards and certification, include a sustainable financing structure for the sector, and promote the use of modern technology. This focus on vocational training can be complemented with a broader agenda of active labor market policies to support job seekers and employers through employment services such as job search support, job counseling, job placement, and recruitment and selection.

Another critical driver of productivity is business innovation, including the creation or adoption of technology, and the process of building capabilities over time. Although the Caribbean could see significant potential gains from stimulating entrepreneurship and innovation, few countries have made systematic efforts to support their entrepreneurs and innovators. Indeed, most countries have small-scale, time-limited, and/or donor-financed initia-

tives offering small amounts of seed capital to innovate products, services, and business models. Moreover, these limited initiatives often lack follow-up supportive ecosystems to develop into startups and scalable enterprises that would attract private capital and dynamize these economies.

This situation calls for the design of relevant and effective innovation support programs covering all stages of the business lifecycle, including the development of public and private incubators and accelerators to support entrepreneurs and innovative firms. The stimulation of university-industry collaboration through technological transfer is another key ingredient. Nonetheless, given the small size of Caribbean economies with the associated diseconomies of scale, it may make more sense to provide more specialized entrepreneurship services such as acceleration, private equity, and venture capital regionally.

Ample empirical evidence has shown that inadequate access to finance impairs firm productivity. Unfortunately, this volume has documented that appropriate access to finance remains elusive for most firms in the Caribbean. Capital markets tend to be underdeveloped and illiquid, forcing firms to rely on credit markets that remain less than adequate. Credit markets are also constrained by structural factors such as limited information regarding risks and borrower histories. Indeed, the limited availability of information on credit histories makes lending more complex, more expensive for the borrower, and uncertain for those considering loan proposals. Moreover, the ecosystems for entrepreneurs and early-stage companies (e.g., incubators, related credit facilities, and venture capital) are less advanced or available in the Caribbean than in many other regions.

The evidence stresses the need for policies to foster credit competition and facilitate financial inclusion. These policies should include establishing credit registries and bureaus to facilitate more effective sharing of credit performance records and strengthen property rights and insolvency procedures, as well as improving financial technologies with adequate safeguards. Technology can and should play a major role in improving credit risk information to unlock more finance. In this area, successful experiences include (a) the use of psychometric tests that can predict an individual's repayment behavior (Arráiz, Bruhn, and Stucchi 2017) and (b) alternative credit scoring mechanisms based on individuals' digital footprints, including call records, the number and types of apps installed, and measures of social connections (Agarwal et al., forthcoming).

In sum, the reforms needed in the Caribbean to foster a more vibrant private sector should not be underestimated or postponed. Enabling favorable business environments is critical to place the region on a sustainable growth path. Consequently, this volume has highlighted key issues

that require attention. Some of these reforms are more urgent than others, and certain countries have already made progress in implementing some of them. Policymakers and the various stakeholders in each country face the task of identifying the best way to move forward and prioritizing the policy agenda. The hope is that the analysis presented here becomes an evidence-based, practical tool to motivate and inform policies with the potential to improve lives across the Caribbean.

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This book shatters the research dearth on the Caribbean private sector. Unveiling the impact of COVID-19, vulnerability to climate change and disasters, weak investment climate, complex policy environment, skills mismatch and education, technology and innovation and financing obstacles, it offers a roadmap to unleash the region's full economic dynamism. A must-read for policymakers and anyone seeking to ignite the Caribbean private sector's full potential.

Preeya S. Mohan, Senior Fellow, Sir Arthur Lewis Institute of Social and Economic Studies, The University of the West Indies at St Augustine

Evoking their warm temperatures, sunny beaches, and natural beauty, we think of Caribbean countries as paradise. However, when we realize that many of them suffer from low growth and high volatility, brought about by negative shocks and policy mismanagement, we may be inclined to think of paradise lost. How can Caribbean countries find the way back to their economic and social potential? The answers are rigorously, orderly, and intelligently presented in this volume.

Norman V. Loayza, Director of the Global Indicators Group, The World Bank

This book highlights that the private sector is the linchpin of sustainable and inclusive economic development and offers feasible solutions to the challenges of Caribbean firms. This timely and highly relevant volume is a reservoir of knowledge on the Caribbean business environment. Readers will appreciate its easy-to-digest content as a salient source of reference for Caribbean firms, policymakers, and academia.

Nadine McCloud, Senior Lecturer, Department of Economics, The University of the West Indies at Mona

This book provides timely and insightful economic and policy analyses of productivity in the Caribbean. It examines the investment climate, innovation, employment and productivity, and the impact of COVID-19. Based on the insightful data and analyses, the volume further provides a recommended policy agenda. I strongly encourage anyone with an interest in the Caribbean and economic and policy frameworks to read this book.

Douglas Cumming, DeSantis Distinguished Professor of Finance and Entrepreneurship, Florida Atlantic University

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