COVID-19 AND ECONOMIC RECOVERY POTENTIAL IN THE CAREC REGION

Edited by Iskandar Abdullaev, Qaisar Abbas, Dina Azhgaliyeva, Ghulam Samad, and Shakhboz Akhmedov

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Abbreviations

ADB	Asian Development Bank
ADBI	Asian Development Bank Institute
AI	artificial intelligence
AML	anti-money laundering
ASEAN	Association of Southeast Asian Nations
AUWSSC	Afghanistan Urban Water Supply and Sewerage Corporation
B2B	business-to-business
B2C	business-to-consumer
BEPS	Base Erosion and Profit Shifting
C/I	cost-to-income
CA	Central Asian
CAREC	Central Asia Regional Economic Cooperation
CATI	computer-assisted telephone interviewing
CFT	combating the financing of terrorism
CGE	computable general equilibrium
CIT	corporate income tax
COVID-19	coronavirus disease
DDS	digitally deliverable services
DSA	debt sustainability analysis
DST	digital services tax
EU	European Union
FDI	foreign direct investment
FRDL	fiscal responsibility debt limit
G20	Group of Twenty
GDP	gross domestic product
GNI	gross national income
GTAP	Global Trade Analysis Project
GVC	global value chain
ICC	International Chamber of Commerce
ICT	information and communication technology
IMF	International Monetary Fund
IP	intellectual property
IRGD	interest rate–growth differential
IT	information technology
KII	key informant interview
KYC	know-your-client
Lao PDR	Lao People's Democratic Republic

MNE	multinational enterprise
MSME	micro, small, and medium-sized enterprise
NBK	National Bank of Kazakhstan
OECD	Organisation for Economic Co-operation and Development
P2P	peer-to-peer
PRC	People's Republic of China
SCD	supply chain disruption
SDG	Sustainable Development Goal
SEC	socioeconomic class
SME	small and medium-sized enterprise
TSCFP	Trade and Supply Chain Finance Program
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNICEF	United Nations Children's Fund
US	United States
VAT	value-added tax
WASH	water, sanitation, and hygiene

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Foreword

The coronavirus disease (COVID-19) pandemic triggered a health emergency that quickly mutated into an economic crisis of unforeseen proportions and dimensions. Containment measures in the form of trade restrictions and prolonged lockdowns snapped critical economic nodes, causing widespread disruptions and losses. Tourism and aviation sectors ground to a halt, small and medium-sized enterprises suffered a very high incidence of firm closures, the manufacturing sector suffered job losses, supply chain disruptions further aggravated production costs, and uncertainties and large-scale job losses put additional pressures on governments. It was clear from the onset of the pandemic that the development and roll-out of vaccines would be critical for containing the epidemic and paving the way of normalcy. The scientific community developed vaccines in record time, and governments rolled out the biggest inoculation programs of human history. In the meantime, guiding economies back to their pre-pandemic levels remains a daunting challenge, despite public policy interventions in the form of packages aimed at averting economic meltdown as well as for sustaining recovery. Central Asia Regional Economic Cooperation (CAREC) countries experienced all those upheavals and challenges, many of which persist.

To sustain recovery, evidence-based response measures are a public policy imperative. While the world is slowly moving toward a new normal, a "Better Recovery" seems, at best, uncertain. In an evolving economic landscape, rethinking and reckoning some policy options and business practices can be pivotal to successfully preparing for new realities. The research findings compiled in the inaugural volume of this CAREC Institute Annual Book reveal how recovery and response measures to crisis might look like across different sectors of CAREC economies.

COVID-19 and Economic Recovery Potential in the CAREC Region comprises an array of analytical works with policy recommendations on recovery through digital transformation, e-taxation, strengthened financial inclusion, and crisis strategies for small businesses and households. The chapters are developed by researchers from the CAREC Institute, the Asian Development Bank Institute, the Asian Development Bank, academic partners, and think tanks.

While demonstrating how digital transformation can accelerate economic growth in the CAREC region, the book shows the potential

benefits of introducing a digital services tax in the broad economic policy contexts of Central Asian economies. Similarly, the book maps the financial ecosystem in CAREC countries and explores the potential opportunities and limitations of fintech adoption and entry points for intraregional cooperation.

The impact of COVID-19 on small businesses is another significant theme of this book. Chapters in the book suggests strategies to help small businesses stay afloat without putting heavy pressure on public finances. The book also demonstrates the interlinkages between the ongoing pandemic and CAREC countries' debt accumulation and provides some recommendations for debt sustainability in the CAREC region. Beyond that, the book ventures into the impact of the crisis on human capital development through analyzing households and informal settlements.
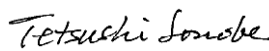
Overall, the content curated in this volume should help researchers and policy makers reshape some responses to the economic and financial implications of COVID-19. Yet the crisis also provides opportunities to develop innovative approaches, some of which figure in book chapters as policy recommendations. Designed for various stakeholders, this book is about crafting the potential for economic recovery so that the CAREC economies can keep pursuing long-term, sustainable growth and human development.

It is expected that this book will help ignite productive discourse in public policy circles to develop evidence-based responses and initiatives for a sustained, long-term recovery in the CAREC region.

Syed Shakeel Shah
Director
CAREC Institute

Tetsushi Sonobe
Dean
Asian Development Bank Institute

Acknowledgments

This volume is the first of an annual book by the CAREC Institute, published with the Asian Development Bank Institute (ADBI). It compiles foundational analysis on the impacts of the coronavirus disease (COVID-19) on various sectors of Central Asia Regional Economic Cooperation (CAREC) economies and proposals for better recovery. Containing nine chapters along with an introduction and summary, the book is a result of contributions made by researchers across and beyond the CAREC region.

Research and organizational efforts for this publication were led by Syed Shakeel Shah, director of the CAREC Institute, and Iskandar Abdullaev, deputy director two of the CAREC Institute, to whom we are grateful. We also gratefully acknowledge the research team of the CAREC Institute led by Qaisar Abbas, along with Dina Azhgaliyeva of ADBI.

The CAREC Institute External Review Board is comprised of leading researchers and economists and includes David Molden of the International Centre for Integrated Mountain Development, Saeed Akbar of the University of Bradford, Yelena Kalyuzhnova of the Henley Business School, Dana Skakova of the European Bank for Reconstruction and Development, Asan Kurmanbekov of Halyk Finance, Muhammad Shahbaz of the Beijing Institute of Technology, Devendra Kodwani of the Open University, Ramin Jahanbegloo of Jindal Global University, and Vaqar Ahmad from the Sustainable Development Policy Institute. The board members helped to revise and correct the initial drafts of the chapters by providing valuable guidance to the authors, for which the CAREC Institute expresses gratitude.

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Summary

Shakhboz Akhmedov, Dina Azhgaliyeva, and Qaisar Abbas

The coronavirus disease (COVID-19) pandemic and subsequent economic crisis have brought unprecedented challenges for countries in the Central Asia Regional Economic Cooperation (CAREC) region, which extends from Azerbaijan to the People's Republic of China (PRC) and is an increasingly important channel for international trade and energy resources. This book explores ways to unlock sustainable and inclusive growth opportunities in CAREC countries by analyzing innovations in digital transformation, e-taxation, financial technology promotion, and debt sustainability, and the impact on small businesses and households. The book is organized in three parts: Part I on Digital CAREC and Post-COVID-19 Economic Recovery; Part II on Economic Dynamics and the COVID-19 Pandemic; and Part III on COVID-19 Impacts on Human Development.

Highlighting the role of digital transformation in recovering the lost economic growth during the crisis, Part I of the book, entitled "Digital CAREC and Post-COVID-19 Economic Recovery," includes research on e-commerce taxation opportunities in Central Asia and the benefits of fintech in trade. These topics are covered in three chapters.

Chapter 1, "Digital Transformation and COVID-19 in the CAREC Region: A Computational General Equilibrium Model" by Muhammad Zeshan, builds the narrative on how the COVID-19 pandemic has triggered a digital transformation and digital technologies have become essential business tools. Developing a Global Trade Analysis Project (GTAP)-based computable general equilibrium (CGE) model for the CAREC countries, the chapter aims to identify how digital transformation can accelerate the lost economic growth in the region. The GTAP framework is a multi-region, multi-sector CGE model that allows a perfectly competitive environment with constant returns to scale, employing a global input-output table of 142 countries (regions) and 65 sectors. The simulation results show that the real gross domestic product (GDP) of all the CAREC countries increases. The highest growth is witnessed in the PRC, Georgia, and Pakistan, where the growth rates of real GDP increase by 2.19%, 2.15%, and 2.14%, respectively.

While conducting comparative analysis of four Central Asian economies (Kazakhstan, Uzbekistan, Tajikistan, and Kyrgyz Republic),

Chapter 2 looks at the current state of e-commerce taxation in broad economic contexts. The goal is to develop tax policy proposals for reform and for regional cooperation. The analysis finds a large gap between Kazakhstan and the other CAREC members and provides details on the extent of this gap. This gap can be observed at the level of tax administration capacity, in the volume of trade in digitally deliverable services, and in the development of e-commerce infrastructure. Recommendations include, first, the introduction of a digital services tax based on the harmonized regional model and, second, increased cooperation between tax authorities and digital platforms. This would be optimal for finding a balance between the policy goals of mobilizing urgently needed tax revenues for financing the post-COVID-19 recovery and creating simple and certain conditions for foreign digital platforms operating inside these economies. Attracting foreign platforms into local economies is critical for the digital transformation of small and medium-sized enterprises (SMEs), and it could partly compensate for their losses due to COVID-19 restrictions.

Chapter 3 examines how trade financing inadvertently falls short of the needs of even viable transactions from smaller firms. In the 2021 Trade Finance Gaps, Growth, and Jobs Survey, two in five of the respondent micro and small firms operating in the CAREC region saw their trade finance applications partially or totally rejected, with many unable to seek alternative finance. Applying the Heckman two-step correction model to analyze a cross-section of firms in various waves of the Asian Development Bank's Trade Finance Gaps, Growth, and Jobs survey, the chapter validates that smaller firms experience higher incidence of trade finance rejections relative to larger firms, owing largely to their unfavorable financial health and history. Interestingly, results suggest the potential of fintech in reducing the unduly high incidence of trade finance rejections among smaller firms, thus advancing financial inclusion. The chapter maps the financial ecosystem in CAREC countries and explores the potential opportunities and limitations of fintech adoption and entry points for intraregional cooperation. Policy proposals put strong emphasis on efficient financial structures, effective regulatory frameworks, and the needed capabilities to advance inclusive trade and finance.

Part II, "Economic Dynamics and the COVID-19 Pandemic," also consists of three chapters that present an overview of debt sustainability of CAREC countries and the impact of the COVID-19 pandemic on SMEs in Central Asia.

Chapter 4 shows how, since COVID-19, most of the CAREC countries have been accumulating debt. Debt service is one of the

important factors to contribute to debt accumulation depending on the size and structure of the economy. The analysis also shows that current account deficit and exchange rate fluctuations also contribute to debt accumulation that subsequently causes inflation in most of the CAREC region. Similarly, the CAREC region also lacks sufficient foreign direct investment to overcome trade deficits and reserve degradation that further causes pressure on a country's Balance of Payments (BoP). Debt sustainability is highly dependent on underlying co-factors; therefore, a holistic analysis varies for each CAREC countries. However, a detailed commentary based on underlying factors may be required to derive a separate analysis based on both optimistic and pessimistic scenarios.

Chapter 5, "Impact of COVID-19 on Small and Medium-Sized Enterprises in Central Asia: Coping Strategies, Government Responses, and Policy Options," analyzes the impact of the COVID-19 pandemic on SMEs in Central Asia. In the analysis, a meta-type methodology integrates, coalesces, and evaluates the pertinent research from heterogeneous studies and databases. The secondary data and information are collected from various national and international publications using data triangulation method and analyzed through a deductive content analysis. The chapter reveals that the pandemic has created simultaneous supply and demand shocks, which impacted SMEs adversely due to limited buffers and second-round effects on domestic demand across the Central Asian countries. SMEs used various coping strategies that focused on retreating, resilience, and agility. The magnitude of fiscal support to SMEs differs across countries. However, generous support to SMEs is likely to put extra pressures on public finances. The Central Asian economies will not revert to a pre-crisis economic situation soon. Therefore, SMEs should adapt to "new normal" sustainable approaches supported by government incentives to scale up for more inclusive growth focusing on education, digitalization, trade facilitation, inclusiveness, resilience, and sustainability. Regional cooperation is essential to foster the agile and resilient strategies for sustainable SMEs.

Chapter 6, "What Determines the Adaptation of Enterprises to COVID-19 in CAREC Member Countries? Empirical Evidence from Azerbaijan, Georgia, Kazakhstan and Mongolia" by Dastan Aseinov, Burulcha Sulaimanova, Kamalbek Karymshakov, and Dina Azhgaliyeva, uses a probit model with data from four CAREC member countries, i.e., Azerbaijan, Georgia, Kazakhstan, and Mongolia, to study how different factors, including firm characteristics and government policy, affect the probability that a firm will be able to adjust its activities to changed

conditions. Chapter 6 uses firm-level data from the World Bank Group Enterprise survey, including a standard Enterprise Survey (baseline) and two waves of follow-up surveys, which were conducted in 2020 and 2021 and include questions mostly related to the COVID-19 situation and the behavior of firms during the pandemic. The results show that firms that adapted to the COVID-19 crisis are younger foreign firms that were innovative in the recent past, with female managers and a formal firm strategy with key performance indicators, and with their own website.

Part III, "COVID-19 Impacts on Human Development," contains three chapters with topics ranging from the impact of the crisis on households and the sustainable development of cities to the analysis of energy consumption behaviors of households during the crisis.

Chapter 7, "Impacts of COVID-19 on Households in CAREC Countries" by Dina Azhgaliyeva, Ranjeeta Mishra, Long Q. Trinh, and Peter Morgan, all from the Asian Development Bank Institute (ADBI), examines the impacts of the COVID-19 outbreak on 10 CAREC member countries, excluding the PRC: Afghanistan, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan. The COVID-19 crisis and the resulting falls in demand and supply due both to uncertainty and policy measures such as lockdowns, social distancing, and travel restrictions are having a severe impact on CAREC member countries. In order to better understand this, computer-assisted telephone interviews of households were conducted in the 10 CAREC countries, with around 1,000 households in each country. Using an ADBI database, Chapter 7 estimates the impact of COVID-19 on income declines, expenditure changes, and financial difficulty in December 2020 compared with June 2020. Households located in lockdown areas experienced reduced income, increased expenditure and increased financial difficulty. Nearly half of households (45%) reported income declines. Households which are more likely to have income declines include those with less educated household heads, male-headed households, those with income from wages, those located in lockdown areas, and those located in urban areas. Households which are more likely to have expenditure increases include the richest groups, those with income from household businesses or self-employment, and those not located in lockdown areas. Households which are more likely get into financial difficulty are those in the lowest socio-economic class (i.e., the poorest group), those having income from household businesses and/or self-employment, and those located in a lockdown area, with the effects varying by country.

Urban areas have become the epicentre of the COVID-19 pandemic. Among other Central Asian countries, Afghanistan and its urban

areas remain the most impacted by COVID-19. Safety measures such as hand-washing and self-isolation have become hard to implement for many people living in Afghanistan without sustainable access to water and housing, especially those in Kabul's informal settlements, e.g., squatter settlements, returnees' camps. Chapter 8, "The Impact of COVID-19 on the Sustainable Development of Central Asian Cities: The Case of Informal Kabul," assesses the impact of COVID-19 on the sustainable development of Kabul by focusing on the challenges in informal settlements. The analysis focuses on two critical components of sustainable and healthy living revealed by the recent COVID-19 pandemic: (i) urban hygiene and access to water and sanitation; and (ii) access to housing, land, and property rights. The data collection strategy included a literature review and conducting of anonymous interviews. The chapter's findings show that people living in informal areas of Kabul experienced a considerable negative impact of the COVID-19 pandemic and its suppression measures. The implementation of handwashing became impractical for informal settlements that do not have adequate access to clean water and struggle with poor sanitation. Urban poor living in the densely populated informal settlements could not practice social distancing or self-isolation. Consequently, informal settlements with poor sanitary conditions have started to serve as the main hot spots for transmitting the virus to the other parts of the city. The study helped identify the lack of local data that makes it challenging to assess the impact of COVID-19 and overall health conditions in the city's informal settlements. The locally implemented top-down policy actions failed to transform informal areas into liveable spaces because they do not account for local needs and living conditions of people residing there. There is an urgent need to introduce policy actions formulated with the representatives of the local communities that are affordable, applicable, and matched with local institutional capacities.

Chapter 9, "Household Energy Consumption Behaviors During COVID-19 in Mongolia" by Dina Azhgaliyeva, Ranjeeta Mishra, and Kamalbek Karymshakov, studies the impact of COVID-19 on households in Mongolia, particularly the awareness about harmful effects of indoor pollution due to combustion of solid fuels for heating and cooking. Chapter 9 uses publicly available MICS Plus survey data from UNICEF. MICS Plus is a longitudinal survey that collects information from a representative sample of 2,000 households through interviews on direct phone calls. Comparison of data from pre-COVID (2018) and during COVID-19 (December 2020) shows that more households switched to cleaner heating. First, the share of households using central heating increased in 2020 to 26% from 19% in 2018. Second, the share

of households using improved fuel for their heating requirements has increased in 2020 as compared to 2018. Third, in December 2020, after COVID-19, households are more likely to use district heating and manufactured space heaters than cooking stoves for heating comparing to 2018. Also, households where the decision maker is female are more likely to have a clean source of heating/district heating system.

Introduction: Global Trends and Post-COVID-19 Recovery in the CAREC Region[1]

Richard Pomfret

The coronavirus disease (COVID-19) pandemic has taken a terrible human toll on Central Asia Regional Economic Cooperation (CAREC) countries, as elsewhere. By late October 2021, around 5 million cases had been recorded in CAREC countries and over 70,000 deaths were COVID-19-related (Table 1). These numbers excluded unreported cases, and the pandemic was far from over. Vaccination rates were low in several CAREC countries, with only Mongolia and the People's Republic of China (PRC) having more than half of the population fully vaccinated.

The economic impact of COVID-19 is less clear. Focusing on specific sectors and issues, this book analyzes how the CAREC region has been impacted and what the main forces shaping and driving the region's agenda in the post-pandemic world are. This introductory chapter reviews CAREC's evolution and identifies economic challenges facing members before the pandemic. It highlights overarching regional and global trends, implications of the pandemic for these challenges, and prospects for post-COVID-19 economic development in the CAREC region.

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[1] This Introduction is a revised version of keynote lecture given at the first CAREC Institute Research Conference on 4–5 March 2021, with the theme "COVID-19 and Potential for Economic Recovery in the CAREC Region".

**Table 1: Reported COVID-19 Cases and Deaths,
and Percent of Population Fully Vaccinated, October 2021**

	Population (million)	COVID-19 cases	COVID-19 deaths	Percent fully vaccinated
Afghanistan	38.9	156,071	7,262	1.1%
Azerbaijan	10.1	520,068	6,939	43.3%
Georgia	4.0	698,944	9,831	24.4%
Kazakhstan	18.8	1,011,656	16,991	39.8%
Kyrgyz Republic	6.5	180,741	2,658	11.3%
Mongolia	3.3	353,504	1,689	66.3%
Pakistan	220.8	1,270,322	28,405	18.2%
Tajikistan	9.5	17,486	125	na
Turkmenistan	6.0	na	na	na
Uzbekistan	33.5	184,233	1,309	17.5%
Xinjiang/Inner Mongolia	25.2/25.4	na	na	na

na = not available.
Notes: For the PRC: 109,306 confirmed cases, 4,849 deaths, and 76.4% of the population fully vaccinated.
Sources: UN population data, 2020; https://coronavirus.jhu.edu (accessed 27 October 2021).

The Origins of CAREC

CAREC traces its origins to a regional technical assistance project approved by the Asian Development Bank (ADB) in 1996 and implemented in 1997. The project focused on transport and communications, energy, regional payments, and trade, and initially covered Kazakhstan, the Kyrgyz Republic, Uzbekistan, and Xinjiang Autonomous Region of the PRC.[2] In 1998, Tajikistan was included in the regional cooperation program, and in 2000, ADB established the Central Asian Regional Economic Cooperation Unit. The focus in 2000 was on regional cooperation in transportation; the most important ADB-supported project in Central Asia during this period was the $70 million loan to Kazakhstan and the Kyrgyz Republic to rehabilitate the Almaty–Bishkek road.

In 2001, CAREC was established with a defined institutional framework. A Ministerial Conference would provide strategic direction,

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[2]   A report, *Regional Economic Cooperation in Central Asia*, was published by ADB in July 1998. At that time, Kazakhstan, Kyrgyz Republic, Uzbekistan, and the PRC were ADB members. Tajikistan joined ADB in 1998, Azerbaijan in 1999, Turkmenistan in 2000, Mongolia in 1991, and Georgia in 2007. Pakistan and Afghanistan have been ADB members since 1966.

while a Senior Officials' Meeting would ensure effective implementation. The first CAREC Ministerial Conference took place in March 2002. In 2003, membership included Azerbaijan, Kazakhstan, Kyrgyz Republic, Mongolia, Tajikistan, Uzbekistan, and Xinjiang Autonomous Region of the PRC, and six multilateral institution partners.[3] In 2005, Afghanistan joined CAREC. At the 2008 summit, the PRC's Autonomous Region of Inner Mongolia was included in the geographical definition of CAREC. In 2010, Pakistan and Turkmenistan joined CAREC, and in 2016 Georgia became the 11th member.

In its early years, CAREC was primarily about confidence-building and encouraging communication among officials. Emphasis was on decisions by consensus, which hindered fast progress but facilitated acceptance of multilateral institutions, especially ADB, as honest brokers. At the same time, it was difficult to hide an underlying sense of slow progress.[4]

At the 5th Ministerial Conference in October 2006, a Comprehensive Action Plan was adopted with the overarching goal of development through cooperation, guided by the long-term vision of "Good Neighbors, Good Partners, and Good Prospects". Adoption of the Comprehensive Action Plan marked CAREC's transition to a results-oriented program with tangible targets and outputs, based on country ownership, pragmatic approaches, and mutual accountability. The focus was to be on four key areas of cooperation: transport, trade facilitation, trade policy, and energy. The Comprehensive Action Plan also called for establishment of a CAREC Institute, as well as periodic updating on the Plan to reflect new developments. The November 2007 Ministerial Conference endorsed the CAREC Institute Prospectus.[5]

The CAREC Transport and Trade Facilitation Strategy endorsed at the 6th Ministerial Conference in November 2007 and the Implementation Action Plan for the Transport and Trade Facilitation Strategy endorsed at the 7th Ministerial Conference identified six priority transport corridors,

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[3]   ADB, the European Bank for Reconstruction and Development, the International Monetary Fund, the Islamic Development Bank, the United Nations Development Programme, and the World Bank.

[4]   ADB's July 2004 Regional Cooperation and Strategy Program for CAREC in 2005–07, for example, referred to "successful regional cooperation efforts" and highlighted the opportunities opened up by increased international attention to Central Asia since 11 September 2001, but also acknowledged that "overall progress on [regional cooperation] initiatives has been modest."

[5]   In the work plan for 2008–10, the "virtual" CAREC Institute operated under the auspices of the CAREC Secretariat, with a small office in Almaty, and contracted with regional and international academic and professional institutions to provide training, research, and outreach.

potentially linking Central Asian countries with each other and their neighbors from the PRC to Europe, and from the Indian subcontinent to the Russian Federation. The Trade Policy Strategic Action Plan was approved at the 7th Ministerial Conference in November 2008 and the Energy Action Plan Framework at the 8th Ministerial Conference in October 2009, but these were less striking.[6]

To implement the results-based orientation of the Comprehensive Action Plan, the 8th Ministerial endorsed the CAREC Program Results Framework to track progress of operations and established a Corridors Performance Measurement and Monitoring (CPMM) Program. The CPMM involved road carrier and freight forwarder associations collecting data on the time and cost of travelling along each CAREC corridor. After working together, the CPMM partner associations proposed the formation of a CAREC Federation of Carrier and Forwarder Associations, which represented a significant increase in private sector involvement in CAREC.

By 2010, CAREC had established itself as the premier institution for regional cooperation in Central Asia, by adopting a gradual strategy, encouraging ownership by member countries, and with substantial financial and human resources support from ADB and other partner institutions. CAREC presents no serious threat to sovereignty, and membership of a large neighbor such as the PRC has been welcomed rather than feared. Similarly, although ADB as the lead institution has devoted substantial resources to its Secretariat role, the presence of other major multilateral institutions is valuable, not only in bringing in potential donors but also in alleviating fears of domination by a single outside body.

CAREC in the 2010s

The 2010s were largely a decade of consolidation, building on foundations laid in the previous decade. Important steps in consolidating CAREC's role as a knowledge-sharing forum have been the regular quarterly and annual CPMM reports and inauguration of the physical base of the CAREC Institute in March 2015 in Urumqi. The CAREC Institute obtained its legal status in 2017.

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[6]   Beyond affirming the desirability of World Trade Organization accession for those countries which were not yet members, CAREC had little to offer in the trade policy area. The CAREC Energy Sector Strategy laid out the rationale and principles for cooperative development of energy resources and identified priority investment projects, technical assistance initiatives, and institution-building requirements. However, most energy issues are settled (or not settled) bilaterally or in ad hoc cooperation rather than through CAREC.

In 2017, ministers endorsed the CAREC 2030 Strategy, which focused on implementation of the Sustainable Development Goals and COP21 climate commitments. CAREC 2030 intended to broaden its scope and to expand participation by development partners. In 2018, CAREC adopted a new integrated trade agenda and, in 2019, began preparing new strategies for energy and transport and developing a tourism strategy.

Despite the positives, CAREC trade patterns scarcely changed from the early 2000s to 2019. Intra-CAREC trade as a share of members' total trade is small and the commodity composition of trade remains concentrated in oil and gas, minerals, and agricultural products.[7] Holzhacker (2020) observed that the integrated trade agenda calls for policies to promote export diversification but so far this has not been happening. Samad and Abbas (2020) emphasized that, although infrastructure investment is needed for successful export diversification, it will be ineffective without significant improvement in soft infrastructure.

The International Economic Background

For the Central Asian former Soviet republics, Azerbaijan, and Georgia, the economic history of the last 3 decades has passed through three phases: nation-building and economic transition during the 1990s, the 1999–2014 resource boom, and the post-boom years of uncertainty.

The 1990s were dominated by nation-building and creation of market-based economies, amid the tumultuous background of the dissolution of the integrated Soviet economy and hyperinflation. The transition from central planning was essentially over by 1999, when the individual varieties of market-based economies and national political systems had been established. This coincided with the start of the resource boom which drove rapid growth in the oil and gas exporters (Azerbaijan, Kazakhstan, and Turkmenistan) and slower but still substantial growth in the poorer countries (in part through labor migration and remittances). The boom ended in 2014; governments acknowledged the need for economic diversification, but were generally slow to take appropriate policy action.

Meanwhile, steady but cumulatively important transport improvements had taken place. In the 1990s, being landlocked and

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[7]   Excluding the PRC (because only two provinces/regions are CAREC members), Holzhacker (2020) reported intra-CAREC trade varying between 5% and 7% of total trade between 2003 and 2019, with no significant trend. CAREC countries' trade in services decreased between 2008 and 2018, despite the rapid growth in global trade in, especially, information technology services.

having poor connectivity were seen as major problems for Central Asia to be addressed within CAREC in 2000s. In the Soviet era, all railways and roads from Central Asia ran north to Russia, with no rail connections to the east, south, or west. During the 1990s, rail lines were opened between Kazakhstan and the PRC and between Turkmenistan and Iran, but the former was used primarily for bilateral trade and the latter was hardly used. In the 21st century, a major exogenous change has been the creation of PRC–European Union Landbridge rail services.

Rail freight between the PRC and Europe increased from virtually zero before 2011, when regular services were first established, to over 300,000 containers in 2019 (Table 2). The early customers were car producers and electronics firms seeking to link their European and Asian value chains and willing to pay a premium over maritime shipping rates to have faster freight with predictable arrival times. Regular timetables set in motion a virtuous circle as increased traffic led to more services (part loads, refrigeration, hub connections, etc.) being provided, which, in turn, stimulated further demand for rail services and competition from new routes (Pomfret 2019a).[8] The COVID-19

Table 2: Volume of Traffic on PRC–EU–PRC Container Trains, 2015–2021

Year	Number of twenty-foot equivalent containers (TEUs)
2015	46,000
2016	104,500
2017	175,800
2018	280,500
2019	333,000
2020	546,900
2021	692,500

PRC = People's Republic of China; EU = European Union.
Source: Eurasian Rail Alliance at https://utlc.com/en/ (accessed 16 February 2022).

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[8]   Interest in the Landbridge was further stimulated by the announcement of the PRC's Belt and Road Initiative. The Landbridge was already flourishing before the official Belt and Road Initiative launch in 2017, but the PRC's commitment to substantial funding increased the attractiveness of overland rail services as a long-term Eurasian transport option (Pomfret 2021a).

pandemic highlighted the advantages of rail transport as ships were stuck in ports due to quarantine rules and ocean shipping rates soared, while air transport was disrupted. Traffic on PRC–EU–PRC container trains in 2021 was more than double its 2019 level.

Currently, these services transit Central Asia without carrying freight to or from the region, which yields substantial fees to Kazakhstan but does not directly promote economic diversification. For Central Asian countries seeking to diversify their export bundles by participating in global value chains or by exporting fruits and vegetables in refrigerated containers, the improved hard and soft infrastructure could provide the necessary connectivity to markets and to input suppliers (Pomfret 2019b). The improved hard infrastructure has included upgrading of lines, especially across Kazakhstan and Uzbekistan, to provide alternative routes and better facilities, as well as reduced time spent at border crossing points.[9] The emergence of Kashi (Kashgar) as the PRC's far west railhead could open future links to Pakistan's Indian Ocean ports and through Kyrgyz Republic and Uzbekistan to Iran and Turkey, although these routes require substantial investment in new track and upgrading of old track. Particularly important for the Caucasus countries is the improved Trans-Caspian route following the opening of the Baku–Tbilisi–Kars railway line (Azhgaliyeva and Kalyuzhnova 2021).

Which countries take advantage of the window of opportunity will depend on their success in implementing economic reforms to reduce the costs of international trade, and of doing business in general (Samad and Qaisar 2020). The CPMM database documents the need and potential for reduction in the costs of crossing borders (Kim and Mariano 2020; Sharafeyeva 2021). Even more important is the need for domestic reform to reduce the disincentives and obstacles to starting a new business.

COVID-19 and the Timing of Reform

Construction and improvement of infrastructure provides a window of opportunity for establishing sustainable economic reform in the 2020s. The spread of COVID-19 in 2020–21 took precedence over all policies (Beirne et al. 2021), without changing the need for policy reform but providing a breathing space to reassess the policy changes needed

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[9]   Acceptance by customs officials of seals on containers reduced border crossing time from days to minutes. At the Kazakhstan–PRC border in 2016, a 40-container train could be transferred from Russian-gauge to standard-gauge rolling stock in less than an hour. Uzbekistan's previously cumbersome transit rules were much improved after the change of president in 2016.

for economic diversification. How that reassessment will turn out is uncertain.

The remaining chapters of this book include studies of some crucial areas for reform. The impact of COVID-19 would have been worse in the absence of digitalization and e-commerce, which provided a way around restrictions on direct personal contact. At the same time, the focus on digitalization highlighted the large gaps in digital preparedness between CAREC members and the need for agreement on related rules and practices, including taxation of e-commerce and data flows. Recent and future economic growth in CAREC is likely to involve urbanization, and CAREC exposed the deadly consequences of poor urban infrastructure, detailed in the chapter on Kabul. The digital revolution also highlights the potential benefits and challenges for small and medium-sized enterprises and the importance of fintech to overcome problems of obtaining trade finance; both topics are analyzed in the COVID-19 context in this book.[10]

Whether the necessary reforms will be implemented depends as much on politics as economics. Apart from the obvious necessity for change since 2014, a positive factor may be the changing generation of leaders in Central Asia. In the countries that became independent in 1991, the first presidents were all men who had spent their entire lives in the centrally planned economy. In 2021, the leaders had all spent most of their adult lives in the market-based economies established in the 1990s (Table 3). Moreover, more than half of Central Asia's population was born after the end of central planning.

Table 3: Central Asian Leaders by Date of Birth

	December 1991		January 2021		Median age of population 2019
	Name	Date of birth	Name	Date of birth	
Kazakhstan	Nazarbayev	1940	Tokayev	1953	32
Kyrgyz Republic	Akayev	1944	Japarov	1968	27
Tajikistan	Nabiyev	1930	Rahmon	1953	25
Turkmenistan	Niyazov	1940	Berdimuhamedov	1957	29
Uzbekistan	Karimov	1938	Mirziyoyev	1957	30

Source: Pomfret (2021b).

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[10]   The collection edited by Beirne et al. (2021) covers all of Asia, but the chapters on the macroeconomic consequences of COVID-19 are relevant to CAREC countries.

At the same time, the partially reformed economies of Central Asia contain powerful individuals who have benefited from the status quo and could be fearful of change. Commander and Prieskienyte (2021) predicted that elite solidarity is likely to prevent economic reforms that disrupt the status quo. Resolution of the tension between elite resistance to change and the pressures for reform will determine whether a country can benefit from the window of opportunity in the post-COVID-19 world.

Conclusions

The need for economic diversification in the national economies of Central Asia is widely recognized. Improved rail infrastructure has allayed the costs of landlockedness for some parts of Central Asia. Likely areas for diversification include value chain participation, which could increase intra-CAREC trade, and export of fruits and vegetables, which is more likely to increase trade with non-CAREC members; regional cooperation in the 21st century is about making regional producers more competitive rather than increasing intra-regional trade. COVID-19 highlighted the advantages of rail transport, especially for trade along international value chains, but also for perishable items.

Whether a country takes advantage of the window of opportunity offered by improved connectivity will depend on economic reforms to reduce the costs of doing business and of international trade. COVID-19 provides a break for rethinking and resetting policy reform. A positive factor for economic reform is that the current generation of Central Asian leaders has spent most of their adult lives in post-centrally-planned economies and may be less suspicious of market-based reforms than their predecessors, but leaders may be driven by the interests of an elite that is content with semi-reformed economies. The resolution of these dilemmas will be decisive for the next decade.

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PART I
Digital CAREC and Post-COVID-19 Economic Recovery

1

Digital Transformation and COVID-19 in the CAREC Region: Computational General Equilibrium Model

Muhammad Zeshan

1.1 Introduction

The coronavirus disease (COVID-19) pandemic has had direct as well as indirect economic effects across countries (Zeshan 2020). Mainstream literature labels the economic consequences of the outbreak as Coronanomics (Barua 2020). The pandemic has triggered a de-globalization process since many Central Asia Regional Economic Cooperation (CAREC) countries are considering border lockdowns that prevent the daily flow of goods, machinery, and humans. These steps have seriously affected production activities and devastated the business community. Many countries have begun to experience a macroeconomic hit caused by the pandemic, and economic experts have devoted most of their time to resolving the forthcoming economic crisis. The COVID-19 pandemic has placed an immense and far-reaching fiscal burden on all the affected countries.

Besides travel restrictions and trade disruptions in the CAREC region, exports in the region suffer from lower commodity prices (Holzhacker 2020). Current events demand that CAREC countries implement careful resource management policies to control price volatility. Moreover, the COVID-19 pandemic reinforces poor macroeconomic trends at the regional and global levels due to the recent disruptions in value chains. To develop a successful regional economic cluster, CAREC countries need to focus on their exports, which is a daunting task during the ongoing pandemic and requires new growth avenues to be explored.

Financial innovations linked with information technology (IT) in finance and trade globalization lead toward various innovative IT tools (Aizenman 2020). Further, the role of IT in the financial sector is widely accepted globally (Yilmazkuday 2011; Goodhart and Sims 2000), although various firms use different software and IT solutions for different business processes such as supply chain management, for human resources, for cloud-based services, and for security purposes (Franco et al. 2020). However, the mainstream literature does not address how the IT sector can facilitate the production process through a labor force better equipped with IT.

The current pandemic increases the scope of IT in various industries beyond the financial sector. This widened scope of IT can play a key role in economic prosperity. Jorgenson and Stiroh (1999) recommend IT as a key substitute for different factors of production such as labor and capital stock. In fact, IT contributed a lot to the economic growth in the United States (US). Application of IT products such as computers contributed roughly 16% to the US output growth during 1990 to 1996. Hence, the IT industry can play a key role in reducing the detrimental effects of COVID-19. IT has many interesting applications to enhance a company's performance. Increasing and upgrading IT facilities coupled with employee training programs linked with the use of technology can greatly enhance the capabilities of global supply chains. Besides, it will have many positive implications for the economic recovery of the region. The mainstream literature also supports the enhanced use of IT to increase the performance of global supply chains (Chang, Tsai, and Hsu 2013; Colin, Galindo, and Hernandez 2015).

In the present era of COVID-19, companies need to provide employees with proper IT equipment to create a successful remote working environment. Many companies provide this by offering employees an allowance to establish a workstation at home where they can complete their job tasks uninterrupted (Kaushik and Guleria 2020). Such an allowance covers various employees' needs such as a suitable internet connection, necessary devices, power backup, and other office equipment. However, many people might not have the required workspace/facilities at home, and they might need to be equipped with alternative solutions.

In understanding the role of remote work in the economy, there are many other factors to consider. The most important is income level. Gottlieb, Grobovšek, and Poschke (2020) find that the share of remote employment is positively correlated with income level. A high-income country can facilitate more employees working from home compared to a low-income country. In agrarian countries, the required facilities are not

available to firms, and a large portion of the working population is unable to conduct work from home. Further, the larger share of agricultural workforce in the poor countries is expected to reduce the returns of IT in the overall economic prosperity. In such an environment, the lower share of the IT sector compared to the agriculture sector reduces the scope of the remote working environment. It also limits the chances of IT clustering regions in a country.

During the COVID-19 pandemic, financial protection matters greatly, particularly to the poor, who spend most of their daily income on food and have almost no savings for health-related expenses (Wang and Tang 2020). In the early stages of the pandemic, such expenditures imposed a considerable economic burden on poor households with severe symptoms. More global efforts are needed to maintain health equity in the CAREC region and to ensure equal medical treatment for all.

The CAREC economies face a real challenge to figure out how they are going to be stable enough to finance their health-related economic costs. The economic costs of COVID-19 are huge, and the recent growth pattern in the CAREC region has not been encouraging. To examine all the aspects, this chapter introduces a computable general equilibrium (CGE) based framework to examine the role of digital transformation in the CAREC region.

The rest of the chapter is organized as follows. A detailed description of the Global Trade Analysis Project (GTAP) framework is provided in the next section. Section 1.3 explains the simulation design and dataset, and Section 1.4 discusses the simulation results. Section 1.5 concludes the study, and policy recommendations and the limitations of the study are provided in Section 1.6.

1.2 Standard Global Trade Analysis Project Framework

At the top level of nesting in the standard GTAP framework, there is a representative regional household whose consumption spending depends on a utility function assigning consumption expenditure across private household consumption, public consumption, and net savings (Hertel 1997; Corong et al. 2017). The current format of regional consumption expenditures has its distinct advantages as well as disadvantages. A major limitation is its failure to link government expenditures to tax revenues. This compromises fiscal integrity, resulting in imperfect coverage of regional tax instruments. In contrast, the core advantage is its explicit welfare indicator arising from the regional utility function.

If taxes are nonexistent, regional households generate income by selling endowments (land, labor, capital, etc.) to firms. The income flow of such transactions is characterized by the value of output at agents' prices of the endowment commodities. Firms combine the endowments with intermediate goods such as value of domestic purchases by firms at agents' prices to produce commodities for final demand. Sales to private households are indicated by the value of domestic purchases by private households at agents' prices; sales to the government are indicated by the value of domestic purchases by the government at agents' prices. Investment goods are also sold to regional households to cater to their demand for savings. This procedure concludes the circular flow of the production process, household income, and consumption expenditure in a closed economy.

Global trade is introduced in the standard GTAP framework by introducing other regions, such as rest of the world. The framework provides the basis for global trade in a regional economy and provides the destination for exports indicated by the value of exports at market prices by destination, with imports linked to specific economic agents. Further, it specifies different import payments to other countries from a private regional households, government, and firms.

An open economic framework also necessitates two global industries. A global bank enables the intermediate dealings between regional investment and global savings and builds a portfolio of different regional investments. Moreover, it trades shares in the portfolio with different regional households to manage their savings. On the other hand, a global sector is essential for trade and transport movements internationally, which could assemble regional exports and provide transport and insurance services.

1.3 Simulation Design and Dataset

In a five-year forward horizon, Bartsch et al. (2020) show technology adoption by consumers and businesses in just eight weeks. Banks have already transitioned to providing remote services to their customers. Grocery stores have moved to online ordering and delivery services, and schools are providing an online learning environment with digital classrooms, etc. Hence, the business world is addressing the current pandemic issues, which hopefully will offer a successful recovery. In all these aspects of recovery, digital transformation undoubtedly plays the main role.

Gottlieb, Grobovšek, and Poschke (2020) and Dingel and Neiman (2020) examine the nature of occupations that can be conducted from

home. More precisely, they examine the portion of professions in a wide career group that can be performed at home. The previous researchers' analysis covers various features of each profession. The distribution of employment varies significantly across different occupations. Further, skilled laborers enjoy more working hours from home than unskilled laborers do. For instance, craft workers report lower working hours from home than managers and professionals. This occupational distribution pattern is not specific to any single country.

We believe that the rising level of employment allowing people to work from home is an indicator of a boost in IT technology and its industrial output. This technological transformation is implemented in the CGE-based GTAP framework through an increased supply of IT-equipped skilled labor force in the production process based on Bartsch et al. (2020); Gottlieb, Grobovšek, and Poschke (2020); Dingel and Neiman (2020); and Worldometers (2020). For this purpose, the framework uses the latest GTAP Data Base version 11, which is developed by Purdue University (Aguiar et al. 2020). It is assembled by combining the input-output tables of various countries connected through global trade flows, generating a global inter-country input-output table. The 142 countries (regions) in the database are aggregated into 9 countries (regions), and 65 sectors are aggregated into 11 sectors. The countries/regions under analysis are: (i) Azerbaijan, (ii) People's Republic of China, (iii) Georgia, (iv) Kazakhstan, (v) Kyrgyz Republic, (vi) Mongolia, (vii) Pakistan, (viii) Tajikistan, and (ix) rest of the world. The sectors are: (i) grains, crops, and animals; (ii) mining and extraction; (iii) processed food; (iv) textiles and clothing; (v) light manufacturing; (vi) computers, electronics, and optics; (vii) heavy manufacturing; (viii) utilities and construction; (ix) transport and communication; (x) human health and social work; and (xi) other services.

1.4 Simulation Results

The simulation results indicate that boosting IT has increased production output in most of the sectors of all the countries under analysis (Figure 1.1). The production level increases in the bigger economies (the People's Republic of China and Pakistan) are greater compared to the smaller economies. Better infrastructure in the bigger economies might be the main reason. Further, the technology boost increases the employment of skilled workers more compared to that of unskilled workers. Hence, the sectors employing skilled workers indicate robust growth while the sectors employing unskilled workers demonstrate moderate decline.

Figure 1.1: Growth Rates of Production Output

AZE = Azerbaijan, PRC = People's Republic of China, GEO = Georgia, KAZ = Kazakhstan, KGZ = Kyrgyz Republic, MON = Mongolia, PAK = Pakistan, TAJ = Tajikistan, ROW = rest of the world.

Note: Short forms for the sectors are as follows: Agri = grains, crops, and animals; LightMnfc = light manufacturing; TransComm = transport and communication; Extraction = mining and extraction; IT = computers, electronics, and optics; Hlth = human health and social work; ProcFood = processed food; HeavyMnfc = heavy manufacturing; OthServices = other services; TextWapp = textiles and clothing; Util_Cons = utilities and construction.

Source: Author's calculations.

The claim that bigger economies are more stable than smaller ones is also supported by current literature. Gottlieb, Grobovšek, and Poschke (2020) point out that the capacity and ability to perform work from home is significantly higher in rich countries compared to poor ones. Better IT infrastructure and a relatively lower share in the agriculture sector in the rich countries are the main reasons behind this phenomenon.

The structural change in CAREC economies also affects the regional trade, where the net exports show an increase in the People's Republic of China, Georgia, and Pakistan while they register a decline in other countries (Figure 1.2). In the People's Republic of China, mining and extraction, utilities and construction, and other services sectors witness the highest export growth rates; in Georgia, grains, crops, and animals and the mining and extraction sectors are the most dominant ones; and in Pakistan, exports in the mining and extraction, human health and social work, and computers, electronics, and optics grew the most. On

the other hand, exports in the heavy manufacturing sector have been severely affected in Azerbaijan and Kazakhstan whereas exports in the human health and social work sector suffered in the Kyrgyz Republic, Mongolia, and Tajikistan.

Figure 1.2: Growth Rates of Net Exports

AZE = Azerbaijan, PRC = People's Republic of China, GEO = Georgia, KAZ = Kazakhstan, KGZ = Kyrgyz Republic, MON = Mongolia, PAK = Pakistan, TAJ = Tajikistan, ROW = rest of the world.

Note: Short forms for the sectors are as follows: Agri = grains, crops, and animals; LightMnfc = light manufacturing; TransComm = transport and communication; Extraction = mining and extraction; IT = computers, electronics, and optics; Hlth = human health and social work; ProcFood = processed food; HeavyMnfc = heavy manufacturing; OthServices = other services; TextWapp = textiles and clothing; Util_Cons = utilities and construction.

Source: Author's calculations.

The changing economic structure has also affected the trade balances in the CAREC region, as not all sectors support the new work environment equally (Table 1.1). For instance, most white-collar professions can work from home, but this is not the case in all sectors. Hence, trade balances are affected in the CAREC region. Nonetheless, all the CAREC countries report positive trade balances except the Kyrgyz Republic and Tajikistan, which report moderate losses of trade balances. Further, the highest trade balances are reported in the People's Republic of China ($118.6 billion), Pakistan ($3.8 billion), and Kazakhstan ($3.2 billion).

Table 1.1: Sector-Specific Trade Balances
($ million)

Sector	AZE	PRC	GEO	KAZ	KGZ	MON	PAK	TAJ	ROW
Agri	–	1,141	29	58	5	–23	157	–14	–2,996
Extraction	1,987	–16,857	–19	5,214	4	335	–114	36	5,854
ProcFood	–62	1,318	25	–52	–14	–21	103	–13	–2,670
TextWapp	–11	14,749	1	–47	–41	–10	969	–12	–16,785
LightMnfc	–46	21,177	–3	–178	–33	–30	704	3	–25,363
IT	–19	20,696	14	–10	–4	–6	187	3	–21,816
HeavyMnfc	–528	66,293	–49	–1,774	–17	–94	876	–7	–72,296
Util_Cons	–94	906	1	–122	0	–12	6	7	–692
TransComm	–63	5,404	74	55	–13	–58	381	1	14,357
Hlth	–5	–302	3	–5	–1	–5	11	0	303
OthServices	–160	4,138	36	68	8	–41	566	–5	–4,610
Total	958	118,663	113	3,206	–104	34	3,847	–2	–126,715

AZE = Azerbaijan, PRC = People's Republic of China, GEO = Georgia, KAZ = Kazakhstan, KGZ = Kyrgyz Republic, MON = Mongolia, PAK = Pakistan, TAJ = Tajikistan, ROW = rest of the world.

Note: Short forms for the sectors are as follows: Agri = grains, crops, and animals; LightMnfc = light manufacturing; TransComm = transport and communication; Extraction = mining and extraction; IT = computers, electronics, and optics; Hlth = human health and social work; ProcFood = processed food; HeavyMnfc = heavy manufacturing; OthServices = other services; TextWapp = textiles and clothing; Util_Cons = utilities and construction.

Source: Author's calculations.

The booming digital economy demands more skilled labor than unskilled labor, which positively affects the sectorial market prices in most of the CAREC countries. The driving cause of economic prosperity in the present model is exogenous technological change, which is skill neutral. In a post-COVID-19 era, it is likely that the employment of skilled labor would register a stronger increase over that of unskilled labor, and skilled labor enjoys a higher relative productivity. With rising labor productivity, the income level of skilled labor escalates as well, resulting in more consumption. The demand for commodities grows, leading to rising commodity prices in most CAREC countries. However, exceptions exist for a few commodities in some countries. For example, Pakistan and the People's Republic of China display falling market prices in most of the sectors, indicating a weak market mechanism

Figure 1.3: Growth Rates of Market Prices

AZE = Azerbaijan, PRC = People's Republic of China, GEO = Georgia, KAZ = Kazakhstan, KGZ = Kyrgyz Republic, MON = Mongolia, PAK = Pakistan, TAJ = Tajikistan, ROW = rest of the world.

Note: Short forms for the sectors are as follows: Agri = grains, crops, and animals; LightMnfc = light manufacturing; TransComm = transport and communication; Extraction = mining and extraction; IT = computers, electronics, and optics; Hlth = human health and social work; ProcFood = processed food; HeavyMnfc = heavy manufacturing; OthServices = other services; TextWapp = textiles and clothing; Util_Cons = utilities and construction.

Source: Author's calculations.

in these countries (Figure 1.3). In Pakistan, market prices decline the most in the human health and social work, other services, and transport and communication sectors. In the People's Republic of China, market prices decline the most in the other services sector and the transport and communication sector.

Overall, the real gross domestic product (GDP) of all the CAREC countries increases. The highest real GDP growth rates are witnessed in the People's Republic of China (2.19%), Georgia (2.15%), and Pakistan (2.14%) (Table 1.2). The rising production level and improved trade balances increase the welfare level (equivalent variation) in all countries; welfare level increases the most in the People's Republic of China ($237.6 billion), Kazakhstan ($5.0 billion), and Pakistan ($4.9 billion).

Table 1.2: Welfare Level and Real Gross Domestic Product

Country/Region	Equivalent Variation ($ million)	GDP (%)
Azerbaijan	1,664	0.97
People's Republic of China	237,644	2.19
Georgia	258	2.15
Kazakhstan	5,078	1.51
Kyrgyz Republic	164	1.52
Mongolia	413	1.38
Pakistan	4,988	2.14
Tajikistan	104	1.10
Rest of the world	2,954,778	4.31

GDP = gross domestic product.
Source: Author's calculations.

1.5 Conclusion

The economic costs of COVID-19 are huge, and the growth pattern in the CAREC region has not been very supportive recently. To figure out how the CAREC economies are going to respond to these issues, the present study introduces a CGE-based GTAP model to examine the role of digital transformation in the CAREC region. From our simulation results, we find that boosting IT and increasing the employment of skilled labor can reduce the economic and social costs associated with COVID-19 in the region. This technological transformation is implemented in the CGE model through an increased supply of IT-equipped skilled labor force in CAREC countries based on Bartsch et al. (2020); Gottlieb, Grobovšek, and Poschke (2020); Dingel and Neiman (2020); and Worldometers (2020). The simulation results show that boosting IT increases the production output in most of the sectors of all the countries under analysis. Further, the production levels increase more in the People's Republic of China and Pakistan compared to the other, smaller economies. Net exports increase in the People's Republic of China, Georgia, and Pakistan while they decrease in other countries. Finally, all the CAREC countries report positive trade balances except the Kyrgyz Republic and Tajikistan, which report moderate losses in their trade balances.

To meet the required health costs associated with the COVID-19 pandemic, direct investment is required in the health sector. Restructuring the medical industry necessitates heavy fixed investment costs. At this stage, it is even harder to assess the type and level of investment required to cope with the COVID-19 pandemic as the relevant technologies are still under development. However, there is a need to evaluate the economic costs of COVID-19, and we believe that investing in the health industry will bring more economic prosperity to the region. The present research framework is unable to figure out the direct health cost of COVID-19, so we rely on existing literature.

Baig et al. (2020) develop a Monte Carlo simulation framework for the US to examine the consequences of COVID-19 infection. It approximates resource utilization and associated medical costs per infection to inspect the potential economic costs of COVID-19 medication. Following Baig et al. (2020) and Worldometers (2020), we calculate the direct health cost of COVID-19 for the CAREC region (Table A1.1). We find that the direct health cost is the highest in Pakistan and Kazakhstan compared to other countries. A comparison of direct health costs with the gains from higher welfare levels indicates that accelerated adoption of IT can effectively offset the direct economic cost of COVID-19 in the short run.

1.6 Policy Recommendations

We believe the following policy measures can improve the economic prosperity in the CAREC region through digital transformation:

- In our simulation results, we increase the IT-equipped skilled labor supply in the production function, which results in higher welfare gains for the CAREC countries. The welfare gains range between $104 million for Tajikistan and $237,644 million for the People's Republic of China. Smaller CAREC economies need to upgrade their IT infrastructure, as promoting the use of IT can offset the direct economic cost of COVID-19 in the short run. Such activities will generate IT cluster zones, which will boost the IT industry and facilitate the growth of skilled labor.
- The direct health costs of COVID-19 are highest in Pakistan (around $2,019 million) and Kazakhstan (around $900 million). In the long run, there is a need to invest more in the health sector to ensure the availability of required vaccination infrastructure at the micro level.
- Lower tariff rates in the CAREC region will promote more regional trade, coupled with a higher regional welfare level.

The present study uses the standard tariff rates from the recent GTAP Data Base version 11. The simulation results show that the People's Republic of China and Pakistan gain the most from regional and global trade since the trade balance of the former increases by around $118 billion and the trade balance of the latter increases by around $4 billion. Reducing tariffs in these countries will provide trade momentum in the region as the cost of doing business will decrease. These tariffs rates can be reduced by at least 5% for the CAREC countries during the pandemic and can be returned to their original levels if needed after gaining the required boost to trade.

- The present research work is based on a short-term static CGE framework. Using a dynamic model can provide different interesting long-run scenarios in the future.
- The present research work does not cover the long-run fixed investment costs associated with the pandemic, which are needed to provide a better understanding of total health related costs of COVID-19 in the region.
- Since the present study focuses on the IT-equipped skilled labor force in the production process, we do not directly focus on unskilled labor. However, the model relies on the relative changes in the demand and supply of skilled labor with respect to other factors of production such as unskilled labor and capital stock.
- We used the GTAP Data Base, which does not contain datasets for all of the CAREC countries. Therefore, the present study focuses only on the countries available in the GTAP Data Base. The GTAP Data Base keeps increasing the number of countries over time. The missing CAREC countries can be analyzed in the future when their data are available.

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Appendix 1.1

Table A1.1: Direct Health Cost of COVID-19

Country/Region	No. of Covid Cases	Estimated Cost ($ million)	Cost (% of GDP)
Azerbaijan	259,476	790	1.933
People's Republic of China	102,734	313	0.003
Georgia	281,761	858	5.282
Kazakhstan	295,506	900	0.540
Kyrgyz Republic	88,374	269	3.492
Mongolia	8,070	25	0.219
Pakistan	663,200	2,019	0.663
Tajikistan	13,714	42	0.587
Total CAREC	1,712,835	5,216	0.041

CAREC = Central Asia Regional Economic Cooperation, GDP = gross domestic product.

Source: Author's calculations, data (no. of COVID-19 cases accessed on 1 April 2021) based on Baig et al. (2020) and Worldometers (2020).

2

E-Commerce Taxation in Central Asia: The Current State and Opportunities for Reform

Nikolai Milogolov

2.1 Introduction

This chapter covers tax policy developments in the context of digitalization and the coronavirus disease (COVID-19) in Central Asia's four leading economies: the Kyrgyz Republic, Kazakhstan, Uzbekistan, and Tajikistan. These economies represent neighboring states with common cultural and economic features because all of them were part of the Soviet Union in the 20th century and all have been striving to transition to market economies during the past 30 years following the collapse of the Soviet Union. The economies have some other features that are important for this analysis: (i) a high level of shadow economies, and (ii) young and large populations. These countries have strong cultural proximity because of their mostly Muslim populations and strong social ties with the Russian Federation. Digitalization was among the important policy priorities in these economies even before the COVID-19 pandemic. In the area of taxation, this agenda includes digitalizing tax administration processes to make them more efficient and adapting national tax laws to the realities of doing business digitally (e-commerce). The COVID-19 pandemic put pressure on governments to speed up tax reforms in this area.

The COVID-19 pandemic has dramatically affected worldwide economic performance due to policies restricting movement and requiring social distancing. These restrictions have compelled businesses to accelerate their digital transformations, contributing to sharply accelerating growth in electronic commerce and digital business. The primary reason for this increased digitalization is the spread of remote work and virtual entrepreneurship (e-commerce); however, only economies where the levels of digital capacity, connectivity, and

infrastructure were already relatively high can easily transform their work and business practices to adapt to the "new normal". Tax control is also turning digital because unnecessary interaction between tax inspectors and taxpayers is undesirable during the pandemic. These new challenges are in addition to the existing ones because even earlier, the process of digitalizing the global economy and business had created numerous conceptual and administrative challenges for tax systems. One example is the problem of taxing the profits of foreign digital companies that have no physical presence in market states but have a large number of users in those states. Therefore, during the COVID-19 pandemic, governments face urgent pressure to design and implement efficient tax administration and tax law reforms to keep pace with digital developments.

Plenty of research has dealt with the related issues of digitalization, policy responses, and economic outcomes of COVID-19 in Central Asian countries. Some important relevant research is outlined below. In a comprehensive Asian Development Bank study (ADB 2021) of laws and policies in e-commerce, the authors recommend modernizing and harmonizing the national legislation of Central Asian countries based on international approaches and best practices. However, this research is not focused exactly on tax law and administration. In a recent Asian Development Bank Institute (ADBI) research report (Olsen et al. 2021), the authors note that tax tools are among the instruments used in Japan, Viet Nam, and Denmark as part of overall governance frameworks for achieving the sustainable development goals and for reacting to COVID-19 outcomes. An ADBI book (Morgan and Yoshino 2021) provides an in-depth study of problems that small and medium-sized enterprises (SMEs) in Central Asia are facing regarding access to finance and their inclusion in global value chains. While tax policy is also not a primary focus of this research, it makes several recommendations related to taxes such as using tax incentives for SMEs as a policy tool. What is more, the authors note that the use of digital financial services (fintech) such as e-money or mobile phones in the reviewed countries is generally low but is increasing rapidly in several countries. Because the existing research literature does not cover the exact topic of developing optimal tax policy to deal with the challenges of digitalization in these countries, this chapter is intended to cover this gap in the literature.

The objective of this chapter is to propose tax policies that are relevant to digital business transformation and COVID-19 economic outcomes in Central Asia's four leading economies: the Kyrgyz Republic, Kazakhstan, Uzbekistan, and Tajikistan. These policy proposals are based on a comparative analysis of the state of play in e-commerce tax regulation, tax administration development, and the economic significance of trade in digital services.

This chapter employs a comparative case study research approach to explore the current situation and desirable outcomes for tax reforms in the e-commerce sector in Central Asia. The differences among the four economies are examined at the levels of their e-commerce infrastructure, tax administration development, and general economic development. As explained by Goodrick (2014) the comparative case study method is appropriate when the context is seen as being important in understanding the success or failure of the intervention. Goodrick states that it may be more efficient to select a relatively small number of cases for the purpose of analysis if the in-depth study of a larger number of cases is not feasible due to resource constraints. This approach is followed in this chapter, which is built around comparative analysis based on secondary data of a high quality. The sample is small (4 countries) for two reasons: first, the goal of the research is to propose tax policy recommendations for these particular countries; and second, due to resource limitations and format, it is not possible to perform such an analysis for a large sample of states.

The results of this research, summarized in section 2.4, will be interpreted considering the mentioned limitations of the method. As such, this chapter can be regarded as a tax policy proposal based on the analysis of important context rather than as empirical economic research or an economic forecast of anticipated outcomes of a particular kind of policy intervention.

I have structured this chapter as follows. This section has described the research approach. In section 2.2, I describe the relevant tax policy issues. In section 2.3, I analyze and compare the states of these countries' tax systems and compare their economic indicators in relation to their tax regulation. I then present the results of the cross-country comparisons to illustrate their relevant economic indicators and tax systems. Finally, in section 2.4, I present tax policy proposals for the advancement of regional cooperation.

2.2 Three Tax Challenges of Digitalization for Central Asia in COVID-19 Times

This section describes three tax policy issues related to digitalization in Central Asia:

(i) Taxation of profits on Big Data "consumer-facing" businesses in market states;

(ii) Value-added tax (VAT) on the consumption of digital services by local businesses and people when such services are supplied by foreign companies that have no physical presence in the country;

(iii) Tax regulation of digital platforms in the shadow economy.

First, a hotly debated issue regarding digitalization today is the reform of international tax rules for Big Data consumer-facing businesses without any physical presence in market countries, such as internet platforms, e-commerce platforms, and internet search engines. Such businesses exploit the data obtained from the local populations and use them as input resources; however, their profits usually cannot be taxed by the market country at the adequate level, so taxation is shifted to low-tax jurisdictions where these companies' intellectual property (IP) is registered (IMF 2019). The application of such outdated principles in the modern, increasingly digitalized global economy results in an unfair distribution of global corporate income tax bases among the world's national states (OECD 2015). Therefore, the crucial principle of profit taxation in line with the value created in the territory of a state is blurred by digitalization because a significant scale of operations in a market state can be achieved without physical mass, even without a permanent (physical) establishment serving as the foreign business's tax nexus. There are various views on this issue, even in developed countries, causing intense debate about digital tax reform at the Organisation for Economic Co-operation and Development (OECD 2019b).

The United Nations (UN) Committee of Tax Experts is also trying to contribute to the global discussion considering the fiscal interests of the developing countries. A crucial deliverable by the UN Committee of Experts on International Cooperation in Tax Matters is the new Article 12B (Income from Automated Digital Services) of the UN Model Tax Convention:

> Article 12B allows a Contracting State to tax income from certain digital services paid to a resident of the other Contracting State on a gross basis at the rate negotiated bilaterally . . . with an option to the taxpayer to pay tax on a net profit basis for the whole year . . . Under Article 12B, a Contracting State is entitled to tax payments for automated digital services if the income is paid by a resident of that State or by a non-resident with a permanent establishment or fixed base in that State and the payments are borne by the permanent establishment or fixed base. Automated digital services are defined to mean services provided on the Internet or digital or other electronic network requiring minimal human involvement from the service provider. (UN Committee of Experts on International Cooperation in Tax Matters 2021, 8–9)

The UN solution may be relevant for the developing states; however, it is difficult to implement because it requires renegotiation of the tax treaty network and also amendments to domestic legislation.

Key contradictions within the digital business taxation reform relate to the scope and design of the new rules, which would result in more taxation in the market states. This causes arguments between the larger European Union (EU) states, which are the major markets for Big Data companies based in the United States (US); and the US, which is home to Facebook, Google, Amazon, and the like. Some countries are even introducing unilateral measures such as a digital services tax (DST), which means an indirect turnover tax imposed on revenues from digital services supplied by foreign companies within market states (Kofler and Sinnig 2019). Such measures are regarded by both the populations and the tax policy makers of the EU as extremely reasonable and urgently desirable given the necessity of addressing the dramatic economic consequences of the COVID-19 pandemic lockdown measures (Thomas 2020). During this pandemic, US-based Big Data companies have obtained luxurious windfall profits (with Amazon, Microsoft, and Apple at the top of the list) (*Financial Times* 2020) resulting from their virtual access to the key markets. So, there is a growing pressure from the market states to tax these profits and afterwards to redistribute these funds for public benefit.

The second tax challenge for digitalization is the reform of domestic VAT systems for taxing consumption of digital services (such as computer games, online advertising, online support, storage and remote processing of information, sale of domain names, and search results processing) supplied from abroad to local customers (business-to-consumer, or B2C) and businesses (business-to-business, or B2B). The OECD's principles for reform in this area can be called an international consensus because there have been no substantial policy disputes about them since 1998, when they were first formulated (OECD 1998). As international experience shows, countries are trying to implement the VAT destination principle where it is administratively feasible. The destination principle for VAT means applying a VAT zero rate in the state of the digital service's supplier while imposing a VAT in the consumers' states. This ensures a level playing field for consumption and international consistency with an absence of VAT double taxation or double non-taxation. Crucial administrative challenges arise while collecting and enforcing the VAT from foreign businesses that do not maintain any physical presence in the country (OECD 2015). For this, the best practice recommended by the OECD is implementing "registration-based collection regimes," meaning VAT collection regimes that are based on a requirement that foreign suppliers register and remit their

taxes in the tax jurisdiction through digital interaction with local tax authorities (OECD 2017).

The third challenge is tax regulation of digital platforms in the shadow economy. One issue discussed today is the opportunities for cooperation between data-driven businesses (platforms) and tax administrations for sharing data to maximize economic efficiency and public benefits. One example of such cooperation comes from the Russian tax system, in which self-employed people can pay minimal taxes (4% of their revenues) through a digital smartphone application. Statistics show that most of such self-employed people work in sectors where internet platforms play a key role in the market, ensuring interaction between the self-employed and their customers through digital apps. Such platforms share data with tax authorities and act as withholding agents if the self-employed people choose this option (Federal Tax Service n.d.). Such cooperation between platforms and tax authorities can potentially work as a powerful policy instrument for driving much of the labor force out of the shadows. As noted in the European Commission report summarizing the results of the literature review on taxation, entrepreneurship, and collaborative economy:

> A system-wide digitization of the tax system can minimize compliance costs, and facilitate the payment of tax liabilities, particularly for small firms and for providers in the collaborative economy. Denmark, Estonia and the UK provide important examples on how the tax administration framework can be streamlined through the careful introduction of digital practices. (EC 2017, 215)

Digital platforms can function as tax withholding agents and information providers for tax authorities, as they aggregate information about all the agents inside the economic ecosystem around the platform (Ogembo and Lehdonvirta 2020). However, there is no best practice recommendation in this regard since individual countries are only starting to experiment with such forms of collaboration between tax authorities and digital platforms.

Several considerations can be outlined to explain why the above-mentioned challenges are increasingly relevant for these Central Asian (henceforth CA) states.

First, the economic consequences of COVID-19 have made digitalization challenges much more acute for CA states than before. As mentioned in a United Nations Development Programme report:

Small and medium-sized enterprises (SMEs) and the self-employed are particularly vulnerable as the demand for services has plummeted.

The effect on firms is mixed, due in large part to a duality in the economies. Surveys show that SMEs, especially those in tourism and hospitality, but also the small manufacturing, construction, transport and trade sectors, are the most vulnerable and are mostly located in urban areas. (Bouma and Marnie 2020, 3)

I suggest that both overall digitalization and switching to digital channels of distribution could compensate for at least part of the losses of the revenue by these urban SMEs. However, such a transformation of SME activities cannot happen without the large digital platforms creating the necessary conditions for e-commerce to function. In the absence of local players, countries must rely on foreign expertise. Currently, two Russian digital platforms (Mail.ru and Yandex) are among the most active foreign digitalized businesses in the CA region. Their business success in this region can be explained by the relatively easy access to the local population because of the common cultural, economic, and social connections with the Russian Federation after the collapse of the Soviet Union. The Russian language is widely used by the local population, especially as a language for digital communication. As foreign digital platforms receive revenues from local markets, a more thorough examination of policy on the taxation of the profits of these platforms and of SMEs operating through such platforms is required.

Second, the largely young CA populations justify the CA states' rights to tax the profits and the consumption of the large foreign digitalized multinational enterprises (MNEs). As Nikolova observes:

> In 2019 all five Central Asian states recorded annual population growth of above one per cent . . . with [the Kyrgyz Republic] and Tajikistan registering even higher growth, of 2.1 and a 2.5 per cent, respectively.

> As a result of this steady population growth, the average resident of the five countries is much younger than in the rest of emerging Europe. . . . all countries of the region have a younger population than the average global population as well. This is best seen in Tajikistan, where 37 percent of the population was in the 0 to 14 age bracket last year. (Nikolova 2020)

This population is composed of either current or future internet users, who are therefore providers of personal data for the benefit of Big Data. Hence, countries where such people reside may possess taxation rights on the profits of such Big Data MNEs, which are obtained from exploiting the data of such digital users as input resources.

In fact, this argument suggests that some part of the digitalized MNE's value chain is located in the territory of the state where the digital users reside even when there is no physical presence of such an MNE in the market state.

Third, significant economic benefits can be obtained from the developed e-commerce platforms operating in the local CA economies and trading in the region. According to recent IMF research (IMF 2019), Asia's participation in online commerce firms is associated with a 30% higher total factor productivity and a 50% higher export rate. This finding is especially important for the development of SMEs in CA, which the OECD (2018) considers a necessary condition for economic diversification, sustainable growth, and innovation. As its report (2018) notes, the OECD claims that "SMEs tend to suffer more from business climate issues than larger firms. They can less afford to bear the costs arising from poor enforcements of contracts, burdensome regulations, non-competitive procurement practices, and frequent inspections, which often serve as opportunities for corruption" (p. 36). Driving local SMEs' economic activity to digital platforms can provide them with access to larger export and domestic markets, financing, and lower entry barriers and transaction costs.

A final issue is the significant role of informal (shadow) and agricultural economic activity, in which bazaars (large markets where vendors sell various goods) play a critical coordinating role (Karrar 2019). According to research by Lerman (2013), agricultural output contributes about a quarter of gross domestic product (GDP) in all the CA states examined here, except for Kazakhstan. Lerman also proposes the following policy recommendation:

> [G]overnments should concentrate on implementing policies that enable small farms to operate profitably and efficiently. The new farming structure that has emerged during the transition requires a new market infrastructure for farm services, including channels for sale of products and delivery of farm inputs, as well as provision of extension, training, and advice services for the small private farmers. (Lerman 2013, 22)

In my opinion, this policy recommendation can be followed by supporting the penetration of e-commerce platforms into agriculture and substituting the grey-zone economic activity of bazaars with digital platforms, which might make the sector more transparent and contribute to economic efficiency, direct market access, and coordination between farmers and consumers, and could therefore lead to fairer trade and distribution of economic benefits.

2.3 Comparative Examination of the Existing Tax Regulation and Economic Indicators for Central Asian States

Selected macroeconomic indicators for Central Asian economies are compared in Table 2.1. The two upper rows in Table 2.1 show the sizes of these economies and their levels of national wealth per capita. The leadership of Kazakhstan appears striking, as this country's economy is much larger and much richer than those of its three neighbors. Kazakhstan's ratio of foreign direct investment (FDI) to GDP is also the highest, which can be explained by its openness to foreign investments in its mineral resources sector.

The bottom two rows in Table 2.1 show the volume of trade in digitally deliverable services, which is more important for this analysis. Digitally deliverable services (DDS) are an aggregation of insurance and pension services, financial services, charges for the use of intellectual property, telecommunications, computer and information services, other business services, and audiovisual and related services. The digitally deliverable services series is based on the concept of potentially information and communications technology-enabled services as developed by the United Nations Conference on Trade and Development (UNCTAD) in a technical note in 2015, as well as in a report of the 47th United Nations Statistical Commission in 2016. Kazakhstan holds its position as a regional leader in both export and import of digitally deliverable services. The differences in volumes of export of digitally deliverable services between Kazakhstan and the other three states are not as dramatic as the differences in the sizes of their GDPs, however. The Kyrgyz Republic's position is noticeable in this context, as it is the only country compared here with a positive trade balance for such services since it exports much more than would be expected from an economy of its size.

The Kyrgyz Republic's success here can be explained by its government's initiative to create High Technology Park—a cluster established to unite teams of professionals in information technology (IT). The Kyrgyz government adopted a decree in 2011 that provides significant tax incentives and exemptions for the residents of this cluster from corporate income tax, value-added tax, and sales tax. Kyrgyz IT professionals are known as reliable and relatively cheap suppliers in the global market of offshore programming with average salaries comparable to Indian IT specialists (about $2,000 monthly on average) (Eurasian Economic Commission 2017).

Table 2.1: Macroeconomic Indicators for Central Asian Economies: Levels of Gross Domestic Product, Foreign Direct Investment, and Trade in Digitally Deliverable Services, 2019

No.	Indicator	Kazakhstan	Uzbekistan	Tajikistan	Kyrgyz Republic
1	GDP ($ at current prices in million)	177,637	55,777	8,375	8,437
2	GDP ($ at current prices per capita)	9,575	1,691	1,315	898
3	FDI/GDP (inward stocks, %)	84.1	17.0	36.7	66.3
4	Export of DDS ($ at current prices in million)	825.8	268.3	9.5	124.7
5	Import of DDS ($ at current prices in million)	5,293.5	449.3	34.9	90.1

DDS = digitally deliverable services, FDI = foreign direct investment, GDP = gross domestic product.
Source: Author's compilation based on data from UNCTAD Stat database (UNCTAD n.d.).

The long-term trends in DDS trade for these CA states in Figure 2.1 show a significant divide in the economic importance of cross-border DDS trade between Kazakhstan and the others. The export trends are sloping downward for all four economies, but the import slope points upward for Kazakhstan and Uzbekistan and downward for Tajikistan and the Kyrgyz Republic. DDS import is exceptionally large in Kazakhstan, but exceptionally low in the other states. Kazakhstan was a net importer of digitally deliverable services in 2019 at about $4.5 billion (about 11 times the volume of the combined exports of the three other states). This observation means that Kazakhstan relies primarily on supplies of such services from third countries, not from its neighbors. Therefore, there is potential for the growth of international trade in DDS, especially for exports to Kazakhstan from its neighbors.

Figure 2.1: Trade in Digitally Deliverable Services (as % of Trade in Services) for Central Asian States

Exports

Imports
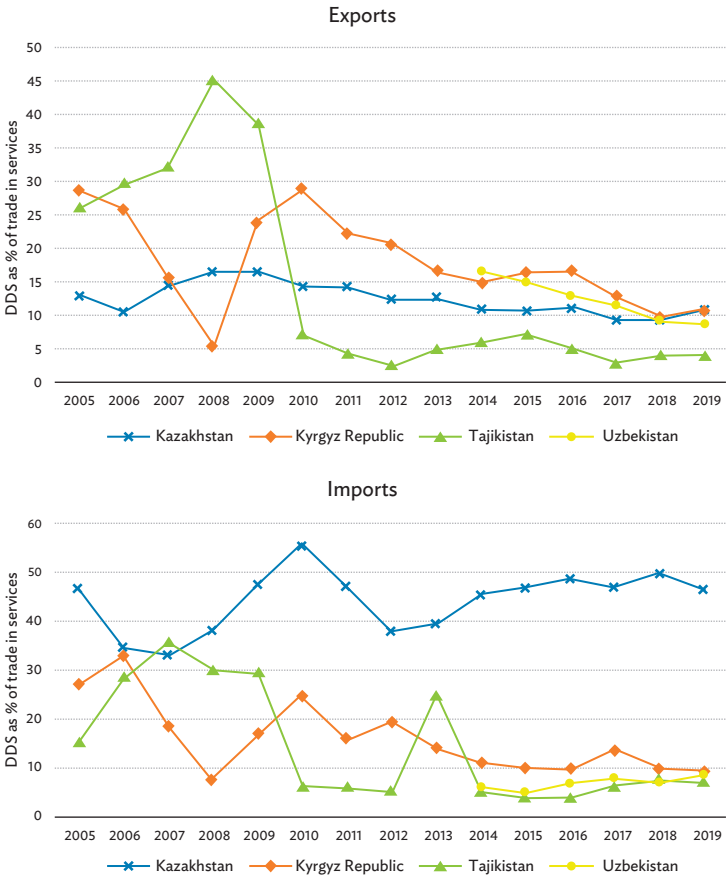
DDS = digitally delivered services.

Source: Author's compilation based on data from UNCTAD Stat database (UNCTAD n.d.).

Table 2.2: Indicators of Business-to-Consumer E-Commerce in Central Asian Economies

No.	Indicator	Kazakhstan	Uzbekistan	Tajikistan	Kyrgyz Republic
1	Share of individuals using the internet (2018 or latest, *%*)	79	52	22	38
2	Share of individuals with an account (15+, 2017, *%*)	59	37	47	40
3	Secure internet servers (normalized amount, 2018)	64	51	33	47
4	UPU[a] postal reliability score (2018 or latest)	72	41	1	20
5	2019 index value[b]	68.2	45.4	25.7	36.4
6	2019 country rank	57	93	129	111

[a] The Universal Postal Union (UPU) is a United Nations specialized agency and the postal sector's primary forum for international cooperation.

[b] The index is calculated as the average of four indicators (i.e., each indicator carries the same weight) using data for 2018 or the latest available: (i) account ownership at a financial institution or with a mobile money service provider (% of population ages 15+), (ii) individuals using the internet (% of population), (iii) postal reliability index, and (iv) secure internet servers (per 1 million people).

Source: Author's compilation based on data from UNCTAD (2019).

Analysis of indicators (Table 2.2) showing the levels of e-commerce infrastructure in these countries yet again proves the leadership of Kazakhstan, while Uzbekistan holds second position. Indictors for all examined states with the exception of Kazakhstan show significantly underdeveloped levels of critically important infrastructure. As noted in recent IMF research:

> Existing digital divides and gaps in key infrastructure such as Internet penetration, delivery logistics, and access to financial accounts, as well as limits in e-commerce legislation, are still preventing many Asian economies from fully reaping the potential benefits. Removing these barriers would further boost e-commerce, supporting international trade, creating more opportunities for businesses, and increasing consumers' welfare. (Kinda 2019, 21)

As the UNCTAD (2019) explains, the B2C E-Commerce Index measures an economy's preparedness to support online shopping. Therefore, indicators presented in Table 2.2 show an example of such a digital divide and gap between Kazakhstan and the three others.

Although removing the barriers to intraregional trade and economic cooperation in e-commerce can potentially narrow this gap, it likely will not be sufficient. Investment in the development of critical infrastructure and digital connectivity is strongly needed in Uzbekistan, Tajikistan, and the Kyrgyz Republic, and the tax reforms suggested in section 2.4 might at least partly cover the deficit of funds necessary for financing such investment. Details of these countries' current tax regulations are outlined in Tables 2.3 and 2.4.

As can be seen from the first row of Table 2.3, the gap in tax administration between Kazakhstan and Uzbekistan is minimal, while the gap between them and Tajikistan and the Kyrgyz Republic is astonishing. Tajikistan has the least-developed tax administration system, ranking 139th globally with a twice-higher nominal tax burden on business than in the three other states (indicator in the second row). Indicators in the third and fourth rows are not much differentiated except for the number of payments per year in the Kyrgyz Republic, which is more than twice as much as in any of three other states.

The Kyrgyz Republic is striving to streamline its tax system, which is still rather complex and burdensome for taxpayers; this economy is noted in the PwC Paying Taxes report (PwC, World Bank, and International Finance Corporation 2019) as being among the states with the largest reductions in the number of payments indicator in 2018 (minus 37 payments). A stand alone tax on interest was incorporated into its corporate income tax (CIT), and online filing and payment were introduced for VAT, CIT, and employee and employer pensions (PwC, World Bank, and International Finance Corporation 2019).

Thus, I suggest that the tax administrations of Kazakhstan and Uzbekistan are better prepared than the other two states to deal with the complex challenges of business digitalization and online tax collection. Investing in the development of digital capacity for tax authorities is critically important for these countries, especially as a precondition for collaborating with e-commerce platforms in tackling the shadow economy.

Recent reforms in e-commerce tax regulation in these four states are summarized in Table 2.4. As can be seen from the top row of Table 2.4, there is a probable trend toward the VAT taxation of foreign digitally provided services in Uzbekistan—where authorities are regional pioneers—and its neighbors. This trend is based on the OECD's recommendations for taxing digitally provided services in the state where they are consumed.

**Table 2.3: Current Situation in Tax Administration
and Compliance in Central Asia, 2020**

No.	Indicator	Kazakhstan	Uzbekistan	Tajikistan	Kyrgyz Republic
1	Overall ranking	64	69	139	117
2	Total tax and contribution rate, % of profits before all taxes[a]	28.4	31.6	67.3	29.0
3	Post-filing index[b]	48.9	48.2	40.4	37.4
4	Number of payments (per year)[c]	10	9	7	26

[a] This indicator can be used to compare the nominal tax burden per taxpayer. The total tax and contribution rate measures the amount of taxes and mandatory contributions borne by the business in the second year of operation, expressed as a share of commercial profit.
[b] This indicator shows efficiency of post filing procedures and is calculated based on scoring. The post-filing index is based on four components—time to comply with VAT refund, time to obtain VAT refund, time to comply with a corporate income tax correction, and time to complete a corporate income tax correction.
[c] The number of different taxes or contributions multiplied by the frequency of payment (or withholding) for each tax. The frequency of payment includes advance payments (or withholding) as well as regular payments (or withholding).

Source: Author's compilation based on PwC data (2020).

Technically, this requires the registration of foreign suppliers with local tax authorities. The Kyrgyz Republic will probably join this trend soon, as it recently declared its intention to implement the same approach. I view such regional harmonization of indirect tax policy as a move in the right direction; adopting the same VAT rules for e-services based on place of destination principle is important for creating a level playing field and ensuring tax neutrality at the international level.

The second row of Table 2.4 shows that the issue of taxing the profits of Big Data consumer-facing MNEs is not yet being addressed in CA with any unilateral measures. Kazakhstan, as the largest economy with the richest population, is a participant in the multilateral Base Erosion and Profit Shifting (BEPS) Project coordinated by the OECD (2019a), by which a multilateral solution is intended for providing market states with more taxation rights on the profits of digitalized "consumer-facing" businesses. The latest report by the OECD indicates that such a multilateral solution (Pillar 1) was published in October 2020. As stated in its abstract, "This report focuses on new nexus and profit allocation rules to ensure that, in an increasingly digital age, the allocation of taxing rights with respect to business profits is no longer

exclusively circumscribed by reference to physical presence" (OECD 2020, 10). Therefore, as the regional leader, Kazakhstan will likely follow this solution.

Unilateral measures in the other states are not yet anticipated because of some regional coordination in tax policy. Introduction of a unilateral measure by one state can create a barrier to its market and therefore loss in regional economic competition in the e-commerce sector. However, positions can change because of urgent fiscal needs to finance the post-pandemic recovery. The primary anticipated effect of OECD Pillar 1 for Kazakhstan is the reallocation of some corporate income tax from the digitalized MNEs to its budget. My assessment (based on Kazakhstan's market volume in digital advertising, the financial statements of two Russian companies [Mail.ru and Yandex], and the Pillar 1 Proposal design) shows that the amount of redistribution will likely not be significant at about $1.5 million for 2018 (which is far less than 0.01% of this year's GDP). The estimates for the other countries are much more modest, leading to my conclusion that the Pillar 1 OECD proposal is too technically complex for local tax policy makers to prioritize in their digital tax agendas.

Finally, the third row of Table 2.4 shows that two countries in the region, Kazakhstan and Uzbekistan, have already introduced some tax benefits for e-commerce businesses. In Uzbekistan, the definition of e-commerce is wider than it is in Kazakhstan, as e-commerce trade there includes not only goods (as in Kazakhstan) but also services. Uzbekistan also has a lower threshold for the share of e-commerce income as part of total income at 80%, while the threshold in Kazakhstan for a business to be eligible for special tax conditions is 90%. As Uzbekistan's regime was introduced two years after Kazakhstan's, I suggest that there is a CA international tax competition for e-commerce businesses between the largest and the second-largest economies. As of 26 December 2020, there were 72 Uzbek small businesses applying for e-commerce treatment (Tijorat n.d.). This is quite a modest result, especially considering the context of the 2020 pandemic, which pushed small businesses toward transforming into e-commerce ones. As is noted in a European Commission literature survey (EC 2017) regarding the effectiveness of tax incentives either by misinformation, complexity, or by the costs involved in the use of tax incentives, the evidence suggests that entrepreneurs might not benefit from all the existing tax incentives. Therefore, I suggest that possible explanations regarding the low popularity of tax incentives for e-commerce in Uzbekistan may be either the high level of compliance costs or the narrow scope of the regime.

**Table 2.4: Tax Developments in E-Commerce in Central Asia
(as of 26 December 2020)**

No.	Tax Development	Kazakhstan	Uzbekistan	Tajikistan	Kyrgyz Republic
1	VAT on import of digital services (B2C/B2B) based on OECD guidelines (foreign service providers must register at local tax authorities and remit VAT)	Effective 1 January 2022	Effective 1 January 2020	Effective 1 January 2021	Announced but not yet introduced
2	Taxation of profits of Big Data from their digital presence in the market (DST/other)	No initiatives declared. Country is BEPS Project Inclusive Framework member; therefore, will likely join the OECD Proposal on Pillar 1	No initiatives declared	No initiatives declared	No initiatives declared
3	Tax regulation of e-commerce platforms	From 1 January 2018, zero corporate income tax rate applies with respect to income generated from e-commerce activities if such income represents at least 90% of total annual income. E-commerce activities defined as entrepreneurial activities focusing on the sale of goods to individuals via online stores and internet websites)	From 1 January 2020, turnover tax rate of 2% (instead of general rate of 4%) applies for entities with turnover of less than 1 billion Uzbek sum (approximately $128,339) for taxpayers included in the national register of e-commerce entities. Income from e-commerce (both goods and services) shall contribute to at least 80% of annual income (Spot 2018)	No initiatives declared	No initiatives declared

Table 2.4 *continued*

No.	Tax Development	Kazakhstan	Uzbekistan	Tajikistan	Kyrgyz Republic
			From 1 January 2020, corporate income tax for taxpayers included in national register of e-commerce entities is 7.5% (with similar criteria as above)		

B2B = business-to-business, B2C = business-to-consumer, BEPS = Base Erosion and Profit Shifting, DST = digital services tax, OECD = Organisation for Economic Co-operation and Development, VAT = value-added tax.

Source: Author's analysis based on data extracted from IBFD (n.d.) database.

2.4 The Way Forward: Addressing Digital Challenges for Central Asia

The analysis in the previous sections of this chapter shows that the digital transformation of business is an important, yet still underdeveloped, aspect of CA economies. This is primarily because e-commerce business development is on the agenda of policymakers in some states, but it is not yet a daily business and consumer reality. The CA e-commerce landscape is also dissimilar among the four states examined here. Kazakhstan is a regional leader, while Uzbekistan is striving to catch up. Uzbekistan's tax policy makers are especially active in regulating e-commerce by providing significant tax benefits both for SMEs and for the largest businesses in the sector. All these countries are trying to ensure a level playing field by taxing foreign-provided digital services in both the B2B and the B2C sectors. I suggest that the coordination of tax policy in relation to the taxation of e-commerce in Central Asia at the regional level can have some economic benefits for the region as a whole. What is more, such coordination could generate the tax revenues required for healing the economic scars of the COVID-19 pandemic.

Outlined in this section are some recommendations that such tax policies might consider to harmonize regionally. One of the most critical issues that I find in this analysis is the significant underdevelopment of the necessary infrastructure for e-commerce taxation, especially in the Kyrgyz Republic, Uzbekistan, and Tajikistan. Funds are needed

to finance any projects aimed at narrowing this gap in development between these three states and Kazakhstan. The problem of developing an optimal policy to achieve success in digitalization is much broader than just tax issues, but the scope of this research is limited to tax policy recommendations. The key idea is to generate additional revenues by taxing foreign large digital businesses, while at the same time creating comfortable tax conditions for local and foreign digital businesses (level playing field), and ensuring efficient tax control.

The second important issue is the significant negative balance in Kazakhstan's DDS trade, which is covered mostly by suppliers from outside Central Asia. I suggest that substantially lowering the barriers to DDS providers would increase the volume of intraregional trade in such services, and income obtained from such increased exports could be directed to financing the gap in domestic infrastructure development. Cooperation between digital platforms and tax authorities can be a useful and appropriate policy tool here.

My suggestion for tax policy is more active cooperation between tax administrations, e-commerce platforms, and SMEs trading through such platforms that aims at driving SMEs from the shadow economy into the formal one. Such a policy can be achieved by the creation of simple and clear tax conditions for the leading foreign and local e-commerce platforms operating in the SMEs' markets. A digital platform can perform the following functions in the tax compliance process: first, it can withhold taxes as tax agent, and second, it can provide real-time information to tax authorities about activity happening on the platform. Mobile applications can be used as efficient tools for self-assessment and for paying taxes by self-employed individuals. Such tax developments can create simple, transparent, and neutral tax conditions for SMEs and self-employed service providers trading through digital platforms. As follows from the Russian experience outlined in Table 2.5, digitalization of tax administration can be used for leveling the playing field in digital markets between local and foreign suppliers, for bringing self-employed people out of the shadow economy, and for tax control of new forms of digital businesses such as internet platforms.

As digital business transformation evolves worldwide, it is appropriate for CA countries to have their own regional position on taxing the profits of Big Data consumer-facing MNEs with virtual economic presence there. Such a position could be different from the OECD Pillar 1 proposal because three of the four CA states examined here are not participating in the BEPS Project. Incorporating the new Article 12B (income from automated digital services) of the UN Model Convention into national tax treaty policy can be a relevant option for CA countries. However, this requires renegotiation of all bilateral tax treaties, which is hard to achieve in practice and takes a long time.

Table 2.5: Digital Technologies in Russian Tax Administration

Digital Technology Implementation Case	Result
VAT registration of foreign suppliers of import digital remote services at the personal cabinet of the taxpayer (online)	FTS estimates revenues of 82 billion rubles (about $1.2 billion) for 3 years
Mobile application for self-employed people used for payment and declaration of tax remotely and without any other formal interactions	• 392,000 self-employed people are out of shadow economy by the end of the first year (2019), 1.5 million in the second year (2020) • During the pandemic, government returned the amount of taxes back to self-employed people as a support measure • 48 large businesses are partners of FTS including e-commerce platforms and banks. They exchange information and withhold tax

FTS = Federal Tax Service, VAT = value-added tax.
Sources: Koshkina (2020), Federal Tax Service of Russia (2017).

My suggestion for the design of a unified position for CA countries is a regionally harmonized turnover tax on the gross revenues of foreign digitalized businesses (DST) based on the common model legislation. Such a DST has two important advantages: fiscal efficiency and simple design. This tax could be administered by the mechanism used for the VAT on digitally provided services; therefore, it is technically feasible. Some countries of the region (e.g., Uzbekistan and Tajikistan) and other developing countries already apply specific indirect taxes (excises) as a tool for the fiscal extraction of rent in the telecommunications sector. In another recent IMF paper (Matheson and Petit 2017), the authors observe that taxes that precisely target possible economic rents or profits are preferable, but also that their administrative challenges may necessitate reliance on service excises at the cost of higher consumer prices and lower connectivity. Hence, I suggest that although an instrument such as the DST is not very precise, it is nonetheless fiscally efficient and simple, yielding tax revenues that are crucial for the CA states to finance their digital development gaps. The DST is also politically acceptable, as it is targeted at economic rents obtained by foreign digitalized MNEs. Model regional legislation could at the same time minimize the current distortions in tax policies among these states and create a level playing field for their intraregional market.

Finally, tax systems are not only about collecting taxes but also about helping businesses in difficult times. Therefore, tax systems are

an inseparable part of the broader fiscal policy. This was especially noticeable during the COVID-19 crisis when tax administrations played a crucial role in channeling government support funds to the most vulnerable businesses. For example, in the Russian Federation,[1] distributed ledger technology was publicly used by the government for the first time in 2020 for creating a blockchain-powered platform of data sharing between the Ministry of Economic Development, Chamber of Accounting, Federal Tax Service, and VEB.RF (the Russian Federation's national economic development institution). Forty credit organizations were connected to this platform and about 500 billion rubles of subsidized loans were provided to the most affected businesses in a very short time. Therefore, such an approach could also be used in the analyzed countries for channeling government support to the most vulnerable businesses.

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[1]   Based on an interview with the Head of Federal Tax Administration of the Russian Federation (Kommersant 2020).

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3

Financial Inclusion in the CAREC Region: Promoting Fintech to Meet Underserved Needs in Trade Finance

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3.1 Introduction

The availability of adequate trade and supply chain finance is paramount to keep trading profits buoyant. The World Trade Organization (2016) estimates that trade finance facilitates up to 80% of international trade. International trade transactions largely rely on trade finances (e.g., Korinek, Cocguic, and Sourdin 2010; Auboin and Engemann 2014; Amiti and Weinstein 2011; Chor and Manova 2012), whereas the lack of adequate trade finance has played an important role in the slump in global trade during the financial crisis.

Despite evidence of its significant role, there is, however, sizable unmet demand for trade finance—estimated at $1.7 trillion in 2020 (Kim et al. 2021). The trade finance gap, the common term denoting the amount of requested trade finance that is rejected, is disproportionately large among micro, small, and medium-sized enterprises (MSMEs) as well as women-owned enterprises even though they account for more than half of the trade finance applications received by banks in Asia and the Pacific.

Trade finance rejections have far-reaching effects, not only among MSMEs but also on the overall economy. MSMEs consistently report lack of access to trade finance constraining their ability to conduct cross-border transactions. Considering how finance influences the decision to export, and without access to alternative sources of financing, these underserved client segments would find it hard to participate in international markets. Export volumes could be below their potential levels, with countries missing opportunities to integrate into global value chains successfully. Rejecting viable transactions from MSMEs makes trade less inclusive, leaving out a valuable potential source for growth and resiliency.

From the macro perspective, the level of financial sector development can help explain the unmet trade finance needs in some regions. The capacity to efficiently handle trade finance instruments hinges on the development of the local financial system and the integration of local firms in international trade (Auboin and DiCaprio 2017). In a similar vein, Amiti and Weinstein (2011) found that incidence of trade finance rejections is higher when firms are associated with financially unhealthy banks. Garralda and Vasishtha (2019) likewise found that an increase in banks' riskiness and short-term funding costs curtails trade finance growth. With high sovereign risk impeding provision of more trade credit, developing countries struggle to provide adequate trade finance flows. Financial institutions prefer low-risk environments considering the security of financing business.

The regulatory environment could also trigger trade finance rejections. Based on the 2021 Trade Finance Gaps, Growth, and Jobs Survey, Kim et al. (2021) found that more than three quarters of respondent banks identified stringent anti-money laundering (AML) and know-your-client (KYC) requirements as the largest barrier to expanding their trade finance operations. While they said regulations ensure robust financial systems, MSMEs and less developed markets are evidently denied from an important form of financing they need to carry out their international transactions.

From the micro level, trade finance requests from firms are hampered primarily by their insufficient collateral or guarantees, lack of a relationship with a financial institution, and insufficient credit or performance history required to perform credible risk assessments. For lenders, a major disincentive to serving these sectors is the high transaction and information costs of having to stringently comply with international regulations and standards, such as AML and KYC.

This chapter examines the challenge of trade finance shortfall in the context of the Central Asia Regional Economic Cooperation (CAREC) region, where 2 in 5 of the respondent micro and small firms saw their trade finance applications partially or totally rejected, with

many of the firms unable to seek alternative finance. The insights from this work could complement efforts that aim to bolster intra-CAREC trade performance and increase exports to other Asian subregions. The coronavirus disease (COVID-19) pandemic can be expected to pivot value chains closer to the main global demand and production centers, which will build up the Asian economic cluster (Holzhacker 2020).

The chapter begins with broad discussions regarding financial sector development and the international trade landscape of the CAREC region from the perspective of trade and supply chain finance. This highlights the significant differences across member countries, which will serve as entry points for cooperation and collaboration. The chapter compares the region's current landscape with advanced economies to draw strategic insights on what areas need further improvement.

The chapter then reviews the existing literature on the issue of trade finance gaps, focusing on their causes. Using microdata from the Trade Finance Gaps, Growth, and Jobs Survey by the Asian Development Bank (ADB), the chapter builds a cross-sectional dataset of firms covering five periods (2015–2017 and 2019–2020) and performs empirical exercises to analyze the various factors driving trade finance rejections disproportionately affecting smaller firms. To overcome the bias from the nonrandomly selected samples, the two-step Heckman correction approach is used. The results indeed show that smaller firms experience a higher incidence of trade finance rejections relative to larger firms, owing largely to their weak financial health and history. Further, the findings suggest that their well-developed financial system can explain the lower incidence of trade finance rejections in higher-income countries.

Lastly, the chapter discusses the emergence of and potential solutions from using financial technologies (fintech) in addressing trade finance gaps. The empirical exercises give some evidence that the use of fintech could aid in lowering the incidence of trade finance rejections disproportionately experienced by smaller firms. The chapter maps and compares the existing fintech environment in CAREC member countries, explores the entry points for cooperation, and identifies potential limitations, risks, and specific circumstances that fintech adoption might pose for the financial well-being of consumers and the financial system. From the mapping exercise, the chapter recommends policy actions to encourage fintech adoption in the CAREC region based on efficient financial structures, effective regulatory frameworks, and the needed capabilities to advance inclusive trade and finance.

3.2 Understanding the Unmet
Trade Financing Needs

There is ample literature highlighting the importance of trade finance for international trade transactions (Korinek, Cocguic, and Sourdin 2010; Auboin and Engemann 2014; Amiti and Weinstein 2011; Chor and Manova 2012). The slump in global trade during the financial crisis can be attributed, among other relevant factors, to a lack of adequate trade finance.

The essential role of trade finance is evident; the lack of adequate access to it denies entrepreneurs the benefits of trade. Enterprises generally abandon potential international trade transactions if their trade finance applications are rejected, especially if they are unable to find appropriate alternative financing (Kim et al. 2021). The use of trade finance mitigates traders' risks by bridging the time lag in international transactions between the manufacture of goods, shipment, and the receipt of payment. For many smaller firms, trade finance helps alleviate cash flow issues arising from when they export goods and when they receive payment.

Despite the potential to reverse the tepid recovery of global trade, a large and growing percentage of businesses struggle to find adequate trade finance. The unmet demand for trade finance amounted to $1.7 trillion in 2020 (Kim et al. 2021). The trade finance gap, hindering some businesses from trading and accessing markets, has repercussions for investment flows and financial inclusion that could affect future economic growth and development (Figure 3.1). With trade having slowed during the COVID-19 pandemic, the International Chamber of Commerce (2020a) expects a capacity of between $1.9 and $5.0 trillion in the trade credit market necessary to facilitate a rapid recovery. Finding solutions to bridge the gap would foster business dynamism, enabling even smaller firms to benefit from the reallocation of production and investment within global supply chains.

It is clear, however, that trade finance applications from smaller firms are more likely to be rejected, implying that international trade remains less inclusive. In ADB's 2021 Trade Finance Gaps, Growth, and Jobs Survey, roughly 40% of rejected trade finance transactions come from small and medium-sized enterprises. Female-owned firms, the majority of which are MSMEs, also face the same challenge.

Many existing studies identified an array of factors that explain trade finance gaps, all of which generally point toward costs and risks

Figure 3.1: Problem Analysis Diagram of the Trade Finance Gap

EFFECTS	Limited international trade activities	Unrealized firm growth potential	International trade less inclusive	Supply chain less resilient amid shocks

CORE PROBLEM	Micro, small, and medium-sized and female-owned enterprises remain the largely underserved customer segments of trade and supply chain finance

CAUSES	**Firm**	**Funding institutions**	**Country**
	• Insufficient collateral or guarantee • Lack of business relationship with financial institutions • Insufficient credit history	• Limited liquidity or internal capacity to offer credit • High transaction and information costs associated with risk assessments • Process inefficiency	• High cost and complexity of regulatory compliance (e.g., anti-money laundering, know your client) • Low level of financial sector depth • Lack of comprehensive credit bureau coverage • High country risk, aggravated by the COVID-19 pandemic

Knowledge and technology gaps
- Information asymmetry
- Low level of technological adoption because of limited skill sets and high cost of adoption
- Less awareness of digital options/solutions
- Lack of globally established rules and standards, and interoperability of digital solutions

Source: Authors' illustration.

particularly associated with small-ticket transactions. On the supply side, processing trade finance applications of MSMEs involves high transaction and information costs. The issuance of letters of credit and guarantees are particularly less attractive for transactions involving smaller firms because of the relatively high operational costs. The cost-to-income ratio in traditional trade finance is 50–60% even before covering costs of risk, liquidity, and capital (WEF and Bain & Company 2018). Further, banks and other financial institutions incur fixed costs from maintaining branch networks, information technology systems, and other support services. The financial sector caters less to the transactions that appear to involve greater risk, a condition that applies primarily to smaller firms with infrequent and small-ticket transactions. Regulation and supervision add to the cost of trade finance transactions.

On the demand side, the volume of trade finance rejections among smaller firms is strongly linked with their inability to provide quality KYC as banks are subjected to increasingly stringent and complex regulatory, sanctions, KYC, and AML requirements. Smaller firm borrowers often lack formal documentation, formal registration, formal financial information, and assets that can be used as collateral. Documentation

requirements, therefore, are too burdensome and involve high bank fees. The stricter standards limit the availability of bank credit, and Basel IV will reduce this scope even further when it comes into full effect by 2022. Other trade finance providers identify poor credit quality or inability of applicants to provide financial statements as major reasons for rejecting applications from smaller firms.

Country-specific factors such as the lack of correspondent banking relationships exacerbated by large global banks pulling out of emerging countries due to the perceived risk of doing business also matter in successful trade finance applications.

3.2.1 Global Actions Bridging the Trade Finance Gap

The global community has taken a proactive role in addressing the trade finance gaps that disproportionately affect smaller firms, especially from developing economies. Since 2005, the World Trade Organization, in cooperation with multilateral development banks, has taken various measures to cater to the underserved trade finance needs in developing economies. Multilateral development banks' financing and/or guarantees supporting around $30 billion in trade transactions in low-income countries, with a greater focus on smaller firms, increased 50% from 2016 to 2018 (Auboin and Behar 2020). The ADB, the European Bank for Reconstruction and Development, the Inter-American Development Bank, the International Islamic Trade Finance Corporation, and the World Bank Group (through its private sector arm, International Financial Corporation) operate programs and schemes that generally aim to support financial and trade inclusion of developing economies.

In Asia and the Pacific, ADB provides guarantees and loans through its Trade and Supply Chain Finance Program (TSCFP) to support international trade. Backed by its AAA credit rating, ADB's TSCFP works with over 200 partner banks to provide companies with the financial support they need to engage in import and export activities in Asia's most challenging markets. With dedicated trade finance specialists and a response time of 24 hours, the TSCFP has established itself as a key player in the international trade community, providing fast, reliable, and responsive trade finance support to fill market gaps. In 2020, while providing efficient responses during the COVID-19 pandemic, the TSCFP supported 7,187 transactions amounting to almost $5.8 billion, including $2.96 billion in cofinancing, and helped more than 2,000 small and medium-sized enterprises meet their trade financing needs.

The International Chamber of Commerce (ICC), for its part, offers knowledge products toward better understanding relevant issues

involving trade and supply chain finance. These include the annual publication of the Global Survey on Trade Finance, which assesses the implications of the regional and global trends in trade and trade finance as well as the Trade Register and Standard Definitions for Techniques of Supply Chain Finance (ADB and UNESCAP 2019).

3.2.2 Framework for Tech-Facilitated Inclusive Trade

Trade finance is one of the crucial elements of international trade flows because it mitigates or reduces the risks involved in transactions between importers and exporters. Alongside the exchange of goods and services, firms also deal with risks relating to, among other things, payments, exchange rates, and political environments. Figure 3.2 illustrates the inclusive trade framework facilitated by digital adoption, particularly in the provision of trade and supply chain finance.

Figure 3.2: Inclusive Trade Agenda Facilitated by Digital Adoption

KYC = know your client, MSME = micro, small, and medium-sized enterprise.

Source: Authors' illustrations.
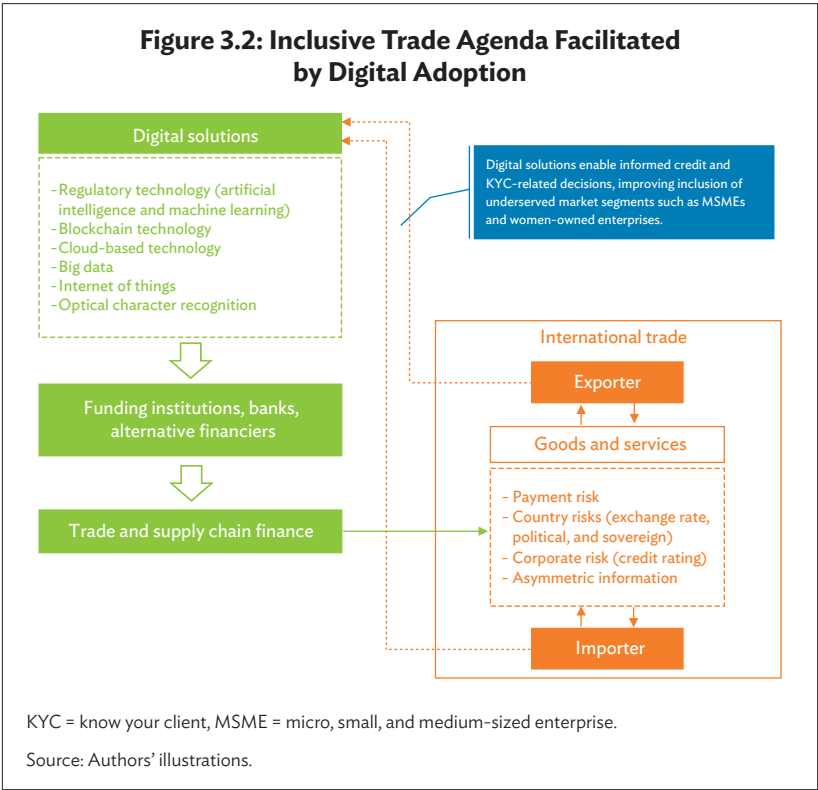
Bank and nonbank institutions, as well as alternative financiers, offer trade and supply chain finance products. Doing this requires a thorough understanding of the underlying risk of the borrowing company, which is fundamental to the pricing and structure of these products. The information required for this includes trade cycles; creditor books, debtor ledgers, and stock held; company performance; and any underlying assets. Exporters and importers use different types of trade and supply chain finance depending on the risks they try to mitigate.

The growing unmet demand in trade finance calls for financial innovation in the form of new delivery channels, products, and providers. Financial innovation should feature more effective risk management and digitalization that could overcome barriers that adversely impact the underserved smaller firms. The digital revolution has extended the frontier of access possibilities by providing tools to overcome the scale of, and risk barriers to, widespread financial inclusion across the developing world (Beck 2020).

Two new types of credit intermediation are progressively competing with banks in their core lending function, both of which use the latest and advanced technologies. The first type, fintech, highlights credit activity facilitated wholly by digital and online platforms not operated by traditional and commercial banks. The second innovation involves the expansion of big tech companies, whose primary activity is digital nonfinancial services including e-commerce, to offering financial products and services. Such business diversification is largely made possible by their access to valuable data on individuals and firms (BIS 2019). Prominent big tech firms in Asia, which include tech giants Alibaba and Tencent, are offering financial services.

In 2019, fintech and big tech credit flows amounted to $223 billion and $572 billion, respectively, a dramatic increase from 2013, when the combined amount of these new types of lending of was $20.5 billion. While fintech credit is emerging in many countries, fintech lending volume has been trending downward in the People's Republic of China (PRC), driven by regulatory reforms and a series of platform exits (Cornelli et al. 2020). The major markets for fintech credit are the PRC, the United States, and the United Kingdom, while big tech credit is growing fast in the PRC, Japan, the Republic of Korea, and some Southeast Asian countries.

The many capabilities of fintech can be mapped to the identified barriers and factors making trade finance—and, therefore, trade—less inclusive. The emergence of innovative fintech solutions, including next-generation payments, peer-to-peer lending, biometrics, blockchain, and artificial intelligence (AI) help automate and streamline processes and promote financial inclusion through the delivery of financial services that are faster, cheaper, and more convenient and secure.

Using distributed ledger technology, supply chain finance can be more cost effective and efficient by replacing complex and paper-based procedures. Blockchain technology can directly enhance the flow of information and overcome compliance challenges, thereby facilitating an inclusive trade and supply chain finance structure. The Hong Kong Monetary Authority's eTradeConnect is a blockchain-based trade finance platform to digitalize trade documents and automate trade finance processes. In collaboration with the Monetary Authority of Singapore, the Global Trade Connectivity Network creates a cross-border blockchain infrastructure to help make trade finance cheaper, safer, and more efficient.

Some of the innovation and technology-backed initiatives and efforts have enhanced the efficiency and availability of finance, and have been particularly beneficial to especially the smaller enterprises. The ADB-supported AI-enabled credit score system facilitated credit access of more than 8,000 small and medium-sized enterprises (SMEs) in the Greater Mekong Subregion of $50,000 each through the end of March 2018. Using AI, the 310 online lending model of the Ant Group (three minutes to apply, one second to approve, with zero human intervention) has already served 29 million SMEs in the PRC, while maintaining the nonperforming loans ratio under 2%, even during the height of the COVID-19 pandemic. Similarly, the ADB-backed cloud-based banking app in the Philippines and branchless banking in Indonesia have contributed to financial inclusion in member economies of the Association of Southeast Asian Nations.

Measures to incentivize adoption of digital solutions among trade finance providers should therefore be encouraged. Digital solutions applied in documentary trade finance could boost bank revenues by as much as $2 billion and increase trade volumes by over $1 trillion (WEF and Bain & Company 2018). Global trade banks could save as much as $2.5 billion by adopting an integrated digital solution that incorporates intelligent automation, collaborative digitization, and future technology solutions, and they could increase their revenues by approximately 10% and reduce operational and compliance costs by 15% to 25% if they embrace digital technology (Dab et al. 2016).

Interestingly, Cornelli et al. (2020) found a strong empirical association between fintech credit volumes and unmet demand for credit, measured by the density of bank branch network. It is broadly consistent with the view that fintech helps serve clients in underbanked areas, thus the underserved segments including smaller businesses. With improved access to trade and supply chain finance, trading firms, including smaller ones, are in a better position to innovate and be more productive and competitive.

3.3 Financial Development, International Trade Structure, and Fintech in CAREC

Based on ADB's 2021 Trade Finance Gaps, Growth, and Jobs Survey, an average of 2 in 5 of the respondent micro and small firms operating in the CAREC region saw their trade finance applications partially or totally rejected; many of these firms were unable to seek alternative finance. Trade finance requests especially from MSMEs in the CAREC region are primarily hampered by insufficient collateral or guarantees and lack of reliable audited financial statements and formal documentation. Inefficiencies of this sort in trade finance result in many applications being unfunded and cross-border trade transactions not being executed.

The gap is further widened by the absence of national export credit agencies in many CAREC member countries, including Afghanistan, Azerbaijan, Georgia, the Kyrgyz Republic, Mongolia, Tajikistan, and Turkmenistan (ADB and UNESCAP 2019). Export credit agencies are particularly suited to the trade finance needs of SMEs since they facilitate lower financing costs relative to commercial banks that extend short-term credit using market-determined interest rates. This cost advantage is embodied in an ADB project that looks at setting up a multilateral trade credit and investment (re-)guarantee agency in the Central Asia, West Asia, East Asia, and South Asia subregions (ADB 2018).

This section discusses the financial sector development and international trade landscape of the CAREC region from the perspective of trade and supply chain finance. The nonhomogenous economic structure across member countries is apparent and serves as a potential entry point for cooperation and collaboration in addressing the trade finance shortfall. Further insights on which areas need further improvement can be drawn by comparing the region's current landscape with that of advanced economies.

3.3.1 Bridging the Gap through Further Advances in the Overall Financial Sector

The unmet trade finance needs in some regions can be associated with their level of financial sector development. The local and international financial systems require development to handle trade finance instruments efficiently (Auboin and DiCaprio 2017). Developed financial institutions can create financial products and services more attuned to the needs of MSMEs. Greater diversification of bank assets through increased lending to smaller firms is also more likely in countries with

higher levels of financial development. Advanced financial markets allow firms to diversify their savings and raise money through stocks, bonds, and wholesale money markets, circumventing challenges from traditional bank lending. In a similar vein, Amiti and Weinstein (2011) found that the incidence of trade finance rejections is higher when firms are associated with financially unhealthy banks.

Figure 3.3a illustrates the dire need to improve financial development in many CAREC member countries, tracing the path taken by the PRC, if possible. The PRC has made great strides during the 2000s, reaching a status on par with that of advanced economies. The PRC has made substantial improvements in developing its financial markets (Figure 3.3c) with, among others, aggressive efforts in tapping

Figure 3.3: Financial Development in the CAREC Region vis-à-vis Advanced Markets

a. Financial Development Index

b. Pillar 1 – Financial Institutions

c. Pillar 2 – Financial Markets

Azerbaijan
Kazakhstan
Mongolia
People's Republic of China
Turkmenistan
Asia and Pacific
Georgia
Kyrgyz Republic
Pakistan
Tajikistan
Uzbekistan
Advanced markets

Source: International Monetary Fund. Financial Development Index Database. https://data.imf.org/?sk=F8032E80-B36C-43B1-AC26-493C5B1CD33B (accessed November 2020).

advanced technologies to serve the financial needs of the people. The PRC is considered a global leader in fintech, with its huge consumer base (Ernst and Young 2019). Mongolia has also done quite well in steering toward financial sector development, albeit the banking sector still accounts for the majority of financial assets (Figure 3.3b). Georgia also performs relatively well in terms of improving access and efficiency of its financial institutions; bank concentration, however, is growing.

The advances in financial sector development in Kazakhstan and Pakistan were stalled during the height of the global financial crisis. The financial market efficiency in Pakistan was hit hard following the Pakistan Stock Market (KSE-100) benchmark index falling by more than half (57%) on 30 December 2008. However, it is worth noting that Pakistan has made consistent gains over time in terms of improving credit availability to the private sector as well as ensuring efficiency of its financial institutions. Meanwhile, the financial development in other CAREC member countries remains subdued by weak financial market frameworks, alongside slow improvement of their traditional banking sectors.

Another area of financial development worth noting in assessing the trade finance gap in the CAREC region is the sustained drop in correspondent banking relationships. Correspondent banking plays a crucial role in cross-border payments; thus, it facilitates cross-border commercial transactions including trade. Erbenová et al. (2016) expressed growing concern about the potential adverse effect on availability of trade finance because of the sustained withdrawal of commercial banking relationships whereby large global banks are pulling out of emerging countries. Rice, von Peter, and Boar (2020) warned that this retreat might hurt financial inclusion either by raising the cost of cross-border payments or driving firms toward less regulated or unregulated channels.

Two clear insights can be drawn from Figure 3.4. First, correspondent banking, which is essential for international trade activities, is limited in Central Asia relative to regional peers in East and Southeast Asia. Second, the correspondent banking landscape in Central Asia exhibits a sustained retreat, reaching almost 8% in 2019. While the retreat of correspondent banks occurs globally, this situation is putting the CAREC region at a greater disadvantage.

Global banks' withdrawal from correspondent banking relationships often relates to the correspondent bank's lack of confidence in the respondent bank's capacity to effectively manage risks linked largely to prudential requirements, economic and trade sanctions, AML and combating the financing of terrorism (CFT), and tax transparency standards (Erbenová et al. 2016).

Figure 3.4: Correspondent Banking Landscapes in Selected Asia Subregions, 2011–2019
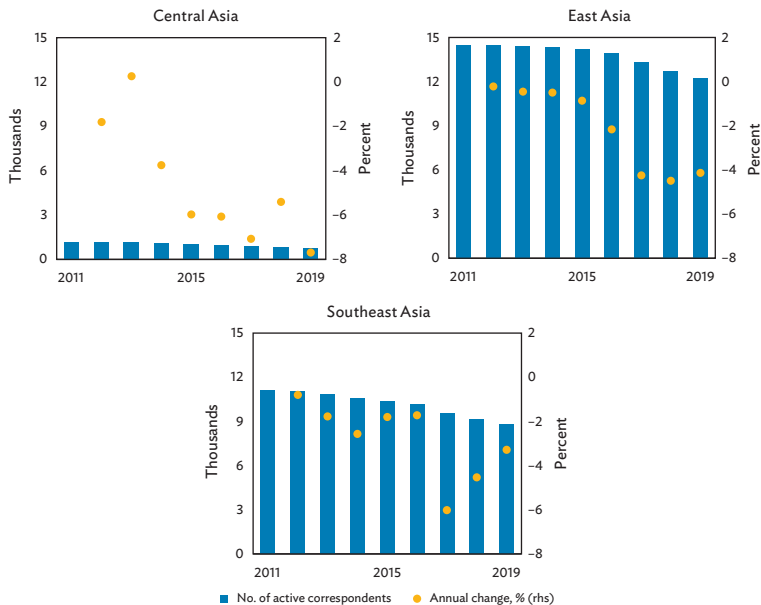
rhs = right-hand side.

Note: Regional grouping is based on the United Nations Statistics Division geographic classifications.

Source: Bank for International Settlements. CPMI Quantitative Review of Correspondent Banking Data. https://www.bis.org/cpmi/paysysinfo/corr_bank_data.htm (accessed November 2020).

Looking at the country level, Tajikistan exhibits the largest decline and has lost more than half of its correspondent banking relationships from 2011 to 2019 (Figure 3.5). It is followed by Azerbaijan and Kazakhstan, with a decline of more than 30% in such relationships. Georgia seems to have endured the global trend, allowing its correspondent relationships to grow by almost 20% during the same period.

The above situation jeopardizes the potential of many countries in the CAREC region to provide access to safe, low-cost cross-border payment channels. As the IMF (2017) noted, addressing complications from such a situation involves strengthened, coordinated, and collective action from public and private stakeholders. It is high time for action as

**Figure 3.5: Changes in the Number of Correspondent
Banking Relationships between 2011 and 2019
in CAREC Member Economies**

Economy	Percent
Georgia	19.9
PRC	−11.8
Mongolia	−11.9
Uzbekistan	−16.2
Kyrgyz Rep.	−22.6
Pakistan	−25.4
Turkmenistan	−25.7
Kazakhstan	−32.4
Azerbaijan	−39.1
Afghanistan	−47.7
Tajikistan	−53.5
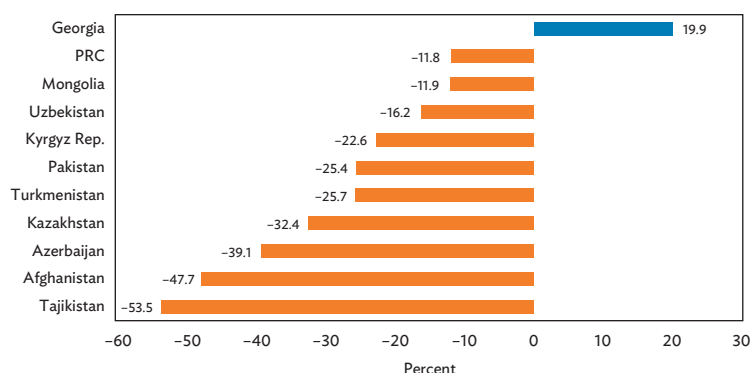
PRC = People's Republic of China.

Source: Bank for International Settlements. CPMI Quantitative Review of Correspondent Banking Data. https://www.bis.org/cpmi/paysysinfo/corr_bank_data.htm (accessed November 2020).

some member economies are effectively addressing concerns regarding the risks associated with money laundering and terrorist financing.

Using the Basel AML Index (Figure 3.6), a substantial drop in such risks is observed in Azerbaijan, Kazakhstan, and Tajikistan between 2013 and 2020. Georgia, on the other hand, sustained a low risk of money laundering and terrorist financing, which partly explains its growing correspondent banking relationships amid the global retreat.

Initiatives toward financial sector development in many countries in the region need to continue to better address the goal of financial inclusion, particularly in financing trade activities. The region has much to gain from tapping alternative financial markets that could cater to the financial needs of smaller clients. This should complement ongoing efforts in many economies in the region to improve their traditional financial institutions. Institutional adjustments also matter if the region hopes to boost correspondent banking relationships. Policy actions should be geared toward facilitating the overall confidence of global financial players in their transactions with many economies in the region.

Figure 3.6: Basel Anti-Money Laundering Index, 2013 vs. 2020

PRC = People's Republic of China.

Note: 0 = lowest risk, 10 = highest risk.

Source: Basel Institute on Governance. Basel AML Index Report. https://baselgovernance.org/basel
–aml-index (accessed November 2020).
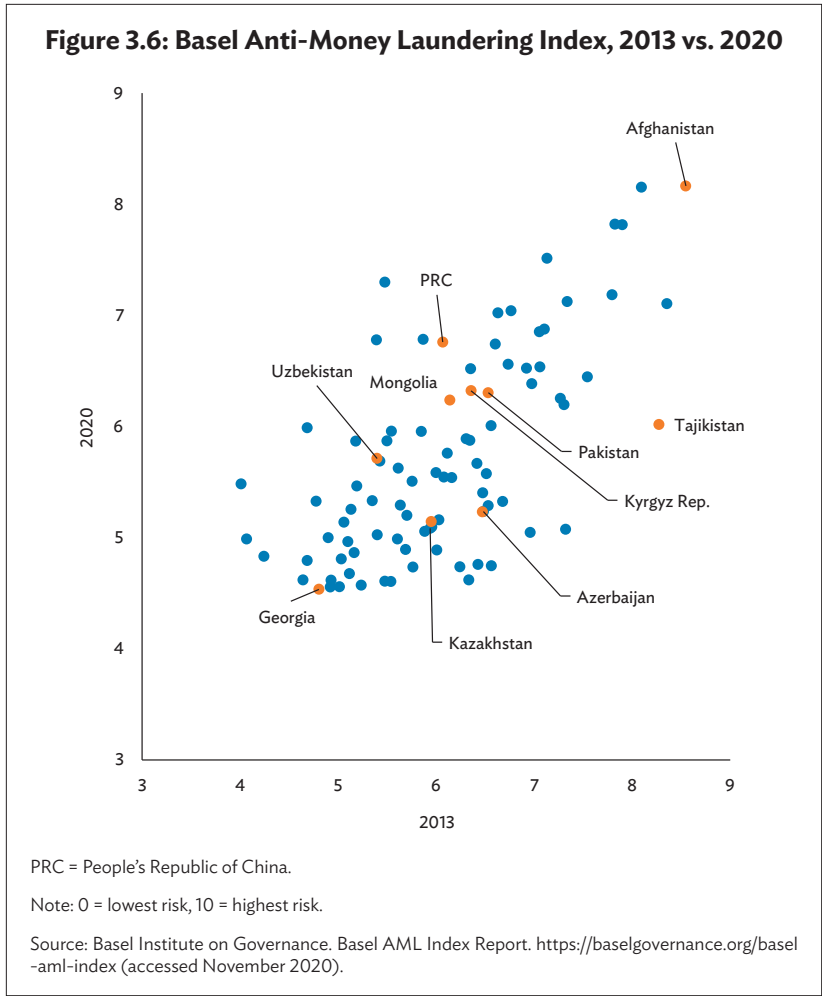
3.3.2 Potential Solutions from Stronger Cooperation and Integration

The key to financial inclusion in the CAREC region may involve a great deal of intraregional effort. Stronger economic cooperation and integration could take advantage of the in-house capabilities in some member countries in overcoming the weaknesses of the other members. Within the CAREC region, the PRC has proved to be in the advanced stages of financial development in both the traditional and tech-heavy sectors.

The region should facilitate further cooperation in many dimensions, which the Association of Southeast Asian Nations has done quite successfully in recent years (Figure 3.7). While the CAREC region has made great strides in infrastructure and connectivity and regional

Figure 3.7: Regional Integration Landscape in CAREC and ASEAN, 2018

CAREC

Afghanistan
Georgia
Mongolia
Uzbekistan
Azerbaijan
Kazakhstan
Tajikistan
People's Rep. of China
Kyrgyz Republic
Turkmenistan

ASEAN

Brunei Darussalam
Malaysia
Singapore
Cambodia
Myanmar
Thailand
Indonesia
Philippines
Viet Nam
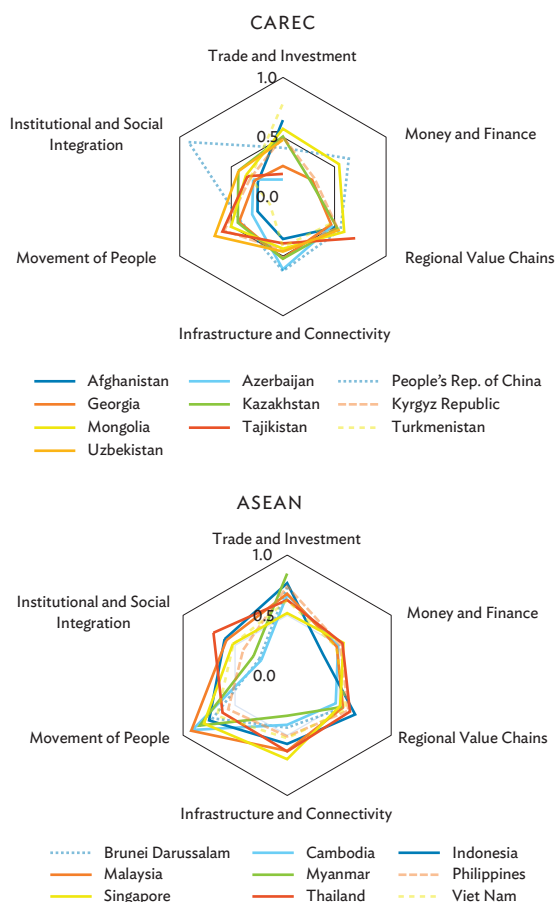
ASEAN = Association of Southeast Asian Nations, CAREC = Central Asia Regional Economic Cooperation.

Note: 0 = not integrated, 1 = fully integrated.

Source: Asian Development Bank. Asia-Pacific Regional Cooperation and Integration Index Database. https://aric.adb.org/database/arcii (accessed November 2020).

value chains, the region should do more to link member economies' money and finance, trade and investment, and institutional and social integration. In the area of money and finance, the region may stand to benefit from the ADB project that looks at setting up a multilateral trade credit and investment (re-)guarantee agency in the Central Asia, West Asia, East Asia, and South Asia subregions (ADB 2018).
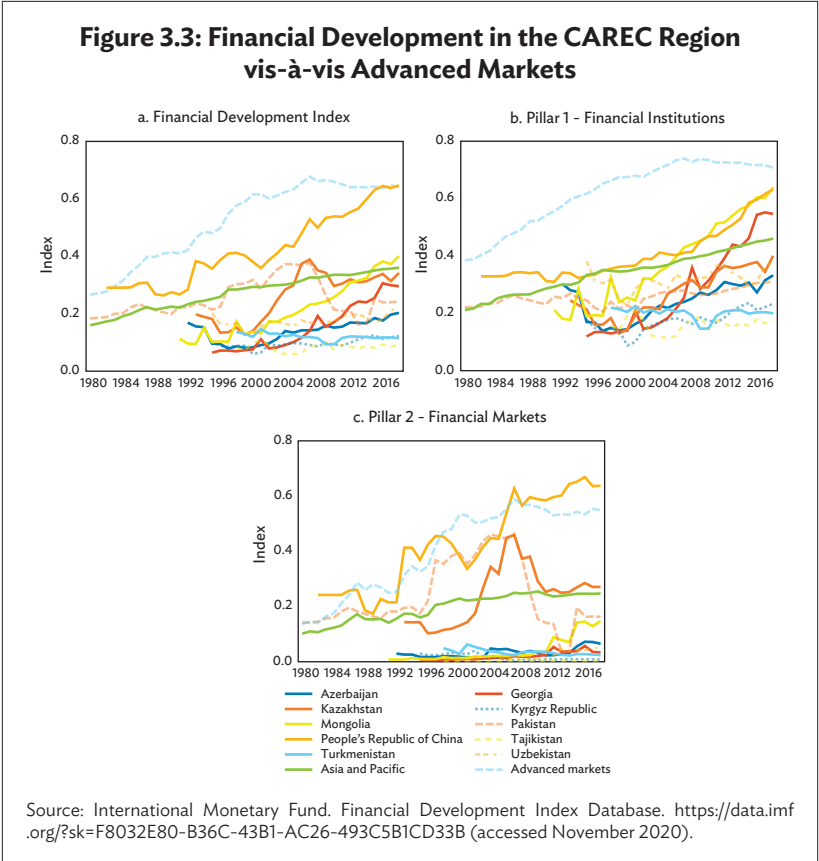
The PRC, for its part, could play a huge role in building capacity within the region and sharing best practices. Over time, CAREC member countries have formed closer trade links with the PRC, diversifying away from the Russian Federation.

While trade distance gradually shortened allowing for diversification of markets, it remains a challenge for many economies in the region to tackle the high product concentration of their exports (Figure 3.8). Trade in the region remains concentrated in mineral fuels, metals, and agricultural products. Product diversification may become more urgent as global decarbonization will reduce the use of fuels toward green, sustainable development.

Figure 3.8: Product Concentration Index of (a) Exports and (b) Imports by Selected Economies, 1995–2019

ASEAN = Association of Southeast Asian Nations, OECD = Organisation for Economic Co-operation and Development, PRC = People's Republic of China.

Source: United Nations Conference on Trade and Development. https://unctadstat.unctad.org/EN/ (accessed November 2020).
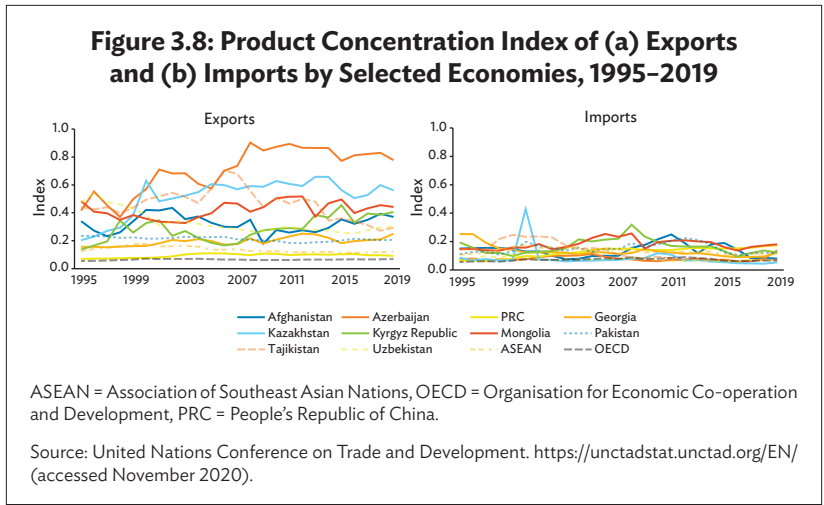
3.3.3 Overview of the Fintech Landscape in CAREC

In general, the rise of fintech supports the goal of helping the poor gain access to the basic financial services necessary to achieve financial inclusion, improving lives and livelihoods and helping countries reach

their full economic potential. Trade finance rejections disproportionately affecting smaller firms can be potentially addressed in the short to medium term with the emergence of institutions and instruments that attempt to serve the underserved market needs.

The growing role of and interest in fintech is evident in some countries that are more adept at keeping pace with digitalization. The advancement of the fintech market in Asia and the Pacific leads the financial sector to a new age of technology and transparency driven by innovation and financial inclusion. While the region plays a leading role in global fintech, it remains concentrated in a few countries including the PRC and advanced member countries.

Using information from the Cambridge Centre for Alternative Finance Global Alternative Finance database,[2] which is largely based on an annual online questionnaire of alternative finance volumes and characteristics (Ziegler et al. 2021), the fintech market across Asia and the Pacific, excluding the PRC, has an estimated value of $8.9 billion in 2020, slightly lower than the $9.5 billion size in 2019 largely because of the disruptions caused by the COVID-19 pandemic (Figure 3.9). Much of the decline is contributed by South and Central Asia and Oceania while markets in East and Southeast Asia sustained positive yet slower growth during the period. Over the past few years, alternative finance has increasingly become a viable funding source for start-ups and small

Figure 3.9: Alternative Finance Market Volume in Asia and the Pacific and the People's Republic of China, 2013–2020
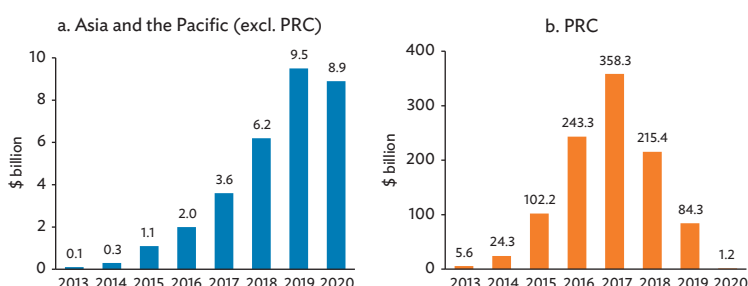
a. Asia and the Pacific (excl. PRC)

b. PRC

PRC = People's Republic of China.

Source: Authors' illustration using information from the Cambridge Centre for Alternative Finance Global Alternative Finance database.

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[2]   The information is representative of funds that were raised via an online alternative finance platform for consumers, businesses, and other fundraisers.

entrepreneurs. In 2020, the largest alternative finance models are peer-to-peer (P2P) consumer lending (accounting for a quarter of the region's total alternative finance), P2P business lending (17%), and balance sheet business lending (16%). Meanwhile, the alternative finance market volume in the PRC continues to exhibit a sudden drop starting from the $358 billion level recorded in 2017 largely due to the closure of numerous P2P lending platforms upon the introduction of stricter regulation regarding P2P lending in the country.

The other CAREC members, meanwhile, lag in the use of fintech, including its application for digitizing trade finance. Figure 3.10 illustrates the relative infancy of the fintech market in the CAREC region, except the PRC, in terms of market size and the number of platforms. Excluding the PRC, the largest market for alternative finance in 2020 was Kazakhstan, facilitating around $173 million in transaction volume. Georgia's alternative finance industry followed with around $18 million in transaction volume during the same period, closely followed by

Figure 3.10: Alternative Finance Landscape (Market Size and Platforms) by Selected Economy, 2020

PRC = People's Republic of China.

Source: Authors' illustration using information from the Cambridge Centre for Alternative Finance Global Alternative Finance database.
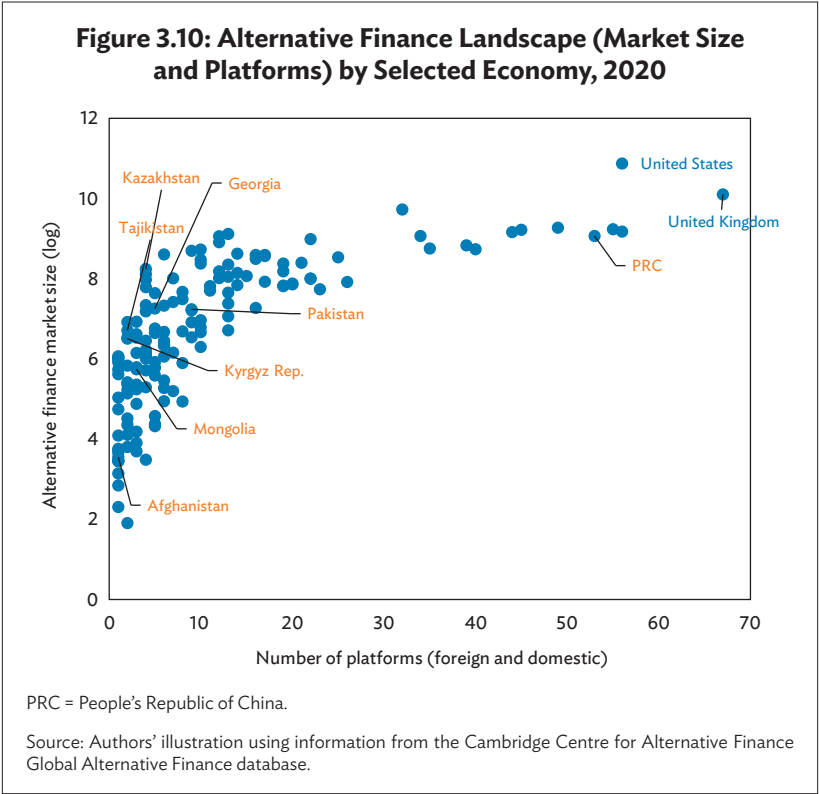
Figure 3.11: Alternative Finance Firms Operating in CAREC, 2020
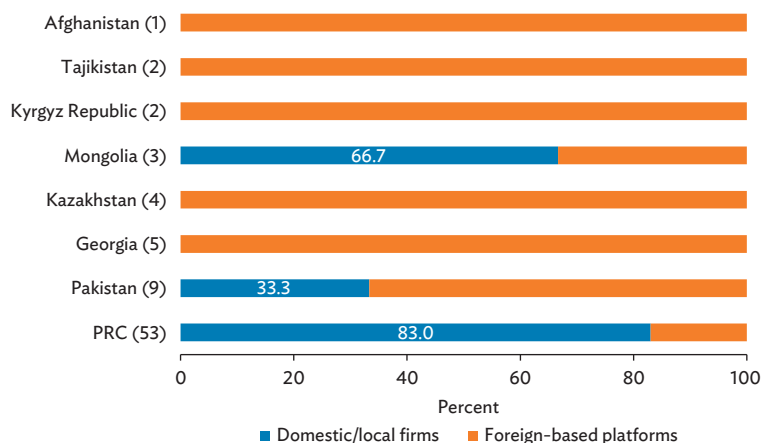
	Domestic/local firms	Foreign-based platforms
Afghanistan (1)		100
Tajikistan (2)		100
Kyrgyz Republic (2)		100
Mongolia (3)	66.7	
Kazakhstan (4)		100
Georgia (5)		100
Pakistan (9)	33.3	
PRC (53)	83.0	

PRC = People's Republic of China.

Source: Authors' illustration using information from the Cambridge Centre for Alternative Finance Global Alternative Finance database.

Pakistan with a $17 million market. The rest of the member economies have less than $10 million in transaction volume.

Ziegler et al. (2021) observed that homegrown or domestic-based alternative finance platforms account for larger proportions of firms especially in countries with fairly developed alternative finance ecosystems. In contrast, foreign-based platforms were most prevalent in emerging markets and account for the majority of the transaction volumes. This can be similarly observed in the CAREC region where, in the PRC, 44 of the 53 remaining firms operating in the country by 2020 were homegrown (Figure 3.11). Other member economies depend heavily on foreign firms, particularly Georgia, Tajikistan, the Kyrgyz Republic, and Azerbaijan.

The fintech ecosystem in the region remains dominated by the payments segment, such as e-wallets. Innovations leading to the emergence of regtech, trade processing, marketplace lending, and crowdfunding remain in the nascent stage (Davletov et al. 2020). Progress is far from complete with digitalization initiatives facing several challenges, such as the high cost of adopting the technology and lack of international rules and standards covering digital trade (see Box 3.1 discussing the readiness of the CAREC region in e-phyto certification).

Box 3.1: CAREC Readiness for E-Phyto Certification

Agricultural trade plays a dominant role in CAREC. However, the digital landscape for the adoption of e-phyto certificates across the region is uneven (see table below). The majority of the CAREC countries are still using hard copy exchanges as a mode of transmission. The exception is Uzbekistan, which has so far fully transitioned electronically. The PRC and Uzbekistan, countries that have successfully transitioned toward adoption of digital technologies, have issued substantial numbers of e-certificates, facilitated by the shorter amount of time needed for processing.

Mode of Transmission and Validity of Phyto Certificates

Country	Mode of Transmission of PS Certificates to Other Users Like Customs and Other Countries	Validity/ Duration of PS Certificates after Issuance and Prior to Export	Fee for PS Certificate	Number of PS Certificates Issued Per Year
Afghanistan	Hard copy	…	AF100 ($1.28) per sheet	…
Azerbaijan	Hard copy	14 days	AZN10 ($5.88)	40,000
People's Republic of China	Hard copy as well as electronic (where countries can transmit/ receive)	Fresh goods: 14 days Other plant products: 21 days In northern region (during winter): 35 days	Free	0.69 million
Georgia	Hard copy	15 days	GEL25–GEL50 ($8.67–$17.33)	3,428 (Border by Georgia Revenue Service) 10,333 (National Food Agency)
Kazakhstan	Hard copy	30 days (from the date of issuance)	Free to individuals and legal entities	Around 0.3 million
Kyrgyz Republic	Hard copy	Requirements of the importing country	Som200 ($2.86)	40,000
Mongolia	Hard copy, via media and website, and by email	5 days to 1 month depending on commodities	MNT10,000 ($3.69)	10,000
Pakistan	Hard copy	90 days	PRs50-PRs300 ($0.32-$1.94)	Around 0.15 million
Tajikistan	Letter of application to legal entities and individuals	30 days	Based on estimates and volume of products	Depends on the volume of the shipment of goods

Box 3.1 *continued*

Country	Mode of Transmission of PS Certificates to Other Users Like Customs and Other Countries	Validity/ Duration of PS Certificates after Issuance and Prior to Export	Fee for PS Certificate	Number of PS Certificates Issued Per Year
Turkmenistan	Hard copy as well as through email (where required)	30 days	Based on tariffs approved by Ministry of Finance and Economy of Turkmenistan	Depends on the number of contracts awarded
Uzbekistan	Electronic	Unlimited until the delivery to the importer's country	Up to 10 kg: MRZP 0.15 Up to 100 kg: MRZP 0.18 Up to 500 kg: MRZP 0.20 Up to 1,000 kg: MRZP 0.25	0.25 million

MRZP = minimal size of salary (month) payment, PS = phytosanitary.
Source: Lazaro et al. (2021).

The issuance of an e-certificate in the PRC takes less than an hour, allowing issuance of 0.69 million e-certificates per year. Similarly, for Uzbekistan, the process takes less than 5 days, enabling the country to issue 0.25 million e-phyto certificates per year. The fundamental factors that push e-phyto readiness in these countries include: (i) legislation for trade facilitation in general and phyto certification in particular, (ii) adapting standardized terms and codes used for computer languages, (iii) secure data exchanges, and (iv) integrating with the hub. For the rest, there is no indication of digital capacities to recognize e-phyto certificates using the hub, in which case they may opt for the GeNS web-based system to produce, receive, and exchange e-phyto certificates through the hub. The magnitude of the issuance of e-certification reflects how technological adoption could ease trading and potentially the trade financing across borders.

3.4 Empirical Analysis

This section details the econometric approach to analyze the essential factors behind rejections of trade finance applications. In particular, the focus is on tracing the systematic differences in the incidences of trade finance rejections across firm sizes, with the end goal of determining the major issue or combination of issues responsible for that outcome.

3.4.1 Data and Empirical Strategy

The analysis works on the available firm-level microdata of ADB's Trade Finance Gaps, Growth, and Jobs Survey, and builds a cross-section of firms responding to the survey years 2015–2017 and 2019–2020. The survey is a joint product of the Private Sector Operations Department and the Economic Research and Regional Cooperation Department of ADB, which aims to gather information on companies involved in international trade about their use of trade finance. The survey asks the firm respondents the percentage of the total value of trade finance applications that were rejected by service providers, as well as their perceived reasons for such an outcome. The survey also gathers various firm-level information on their sales, international trade transactions, major export and import markets, number of employees, percentage of female employees, female ownership, and foreign ownership, among others.

The analysis investigates the major determinants of trade finance rejections using a Heckman-type selection model pioneered in Heckman (1976). Using this framework, the analysis and the corresponding results could overcome sample selection bias embodied likely from the (i) survey's nonprobability sampling strategies, (ii) nonresponse on some important questions, and (iii) the nonrandom missingness in the outcome variable, trade finance rejection rates. The latter is simply explained by the fact that rejection rates can occur only if firms apply for trade finance, hence it is observable for a portion of the data.

The main specification for the analysis, following Heckman (1976), involves two separate equations (the main and sample selection equations) as follows:

$$y_i = x_i'\beta + \mu_i \qquad (1)$$

$$s_i^* = z_i'\gamma + v_i \qquad (2)$$

Equation 1 refers to the response equation with outcome y_i, while equation 2 is the selection equation where s_i^* is a latent variable, with y_i only observed when $s_i^* > 0$. The vectors of explanatory variables are given in x_i' and z_i', where x_i' is assumed to be a subset of z_i' suggesting that the factors predicting the main outcome of interest y_i also predict the selection s_i. μ_i and v_i are error terms assumed to be normally distributed.

The model is estimated using a two-step method by first estimating a probit regression for equation 2 followed by a least squares regression of equation 1 adjusted to add first step results. For the exercises in this chapter, y_i refers to the trade finance rejection rates of company i. The x_i' vector for the baseline model includes firm size, firm age, annual sales, foreign ownership dummy, female ownership dummy, sector in which company i operates, and the income classification of the country where the company operates. The vector z_i', which determines whether y_i is observed or not, includes an international trade activity dummy (1 if exporter/importer, 0 otherwise) and a trade finance requirement dummy (1 if a firm needs trade finance to execute export/import activities, and 0 otherwise).

Dependent variable. To analyze the causes of underserved trade finance demand by smaller firms, the dependent variable is the incidence of trade finance rejections of respondent firms. It is measured as the percentage of the total value of the company's trade finance applications.[3] By firm size, it is evident that MSMEs experience higher rejection rates relative to large firms, also true in the CAREC region. Using all samples, the average rejection rate of large firms is about 7%, three times lower than that of micro and small-sized firms (Table 3.1, section a). Meanwhile, Table 3.1, section b shows that such a pattern is observed in CAREC samples, i.e., the rejection rates of large firms are, on average, 10% of their total trade finance applications while those of smaller firms range from 17%–32%.

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[3]   Note that for the 2021 Trade Finance Gaps, Growth, and Jobs Survey, this information is asked of the respondents as a range of values in 10% intervals, i.e., less than 10%, 10% to <20%, ... 50% or more. To be able to use the latest information and expand the number of observations for the empirical exercises, the average values are used as an alternative, i.e., for less than 10%, it is replaced by 5%, and so on.

Table 3.1: Rejection Rates by Firm Size, % of Trade Finance Applications

Firm Size	No. of Observations	Mean	Std. Dev.	Min	Max
a. All samples					
Micro and small firms	624	22.6	36.2	0	100
Medium firms	740	18.2	32.2	0	100
Large firms	56	7.3	18.2	0	100
b. CAREC samples					
Micro and small firms	14	31.5	43.1	0	100
Medium firms	64	17.4	32.4	0	100
Large firms	10	10.1	31.6	0	100

CAREC = Central Asia Regional Economic Cooperation.

Note: Resulting statistics are based on pooled sample of firms during the multiple survey periods, 2015–2017 and 2019–2020.

Source: Authors' estimates.

By industry, there is little to moderate variation in rejection rates faced, with the agriculture and mining sector experiencing a higher average incidence of trade finance rejections (Table 3.2). It is interesting to note that in the CAREC region, the agriculture and mining sector experiences extremely high rejection rates, almost four times those of the manufacturing and services sectors. This observation does not sit well with the fact that agriculture and mineral products dominate intra-CAREC and trade outside the region (Holzhacker 2020).

Table 3.2: Rejection Rates by Industry, % of Trade Finance Applications

Industry	No. of Observations	Mean	Std. Dev.	Min	Max
a. All samples					
Agriculture and mining	312	27.3	36.7	0	100
Manufacturing	329	17.0	31.8	0	100
Services	765	18.2	33.2	0	100
b. CAREC samples					
Agriculture and mining	10	44.4	48.6	0	100
Manufacturing	34	14.0	29.7	0	100
Services	44	16.7	32.3	0	100

Note: Resulting statistics are based on pooled sample of firms during the multiple survey periods, 2015–2017 and 2019–2020.

Source: Authors' estimates.

Another important element of financial inclusion is to ensure that female-owned enterprises are not disproportionately rationed out of trade finance access. However, Table 3.3 shows that the rejection rates are higher for female-owned companies in both samples, albeit in the CAREC region the figure is far higher.

Table 3.3: Rejection Rates by Female Ownership, % of Trade Finance Applications

Female Ownership	No. of Observations	Mean	Std. Dev.	Min	Max
a. All samples					
Female-owned enterprise	625	20.6	34.7	0	100
Non-female-owned enterprise	608	16.8	31.4	0	100
b. CAREC samples					
Female-owned enterprise	14	27.1	41.8	0	100
Non-female-owned enterprise	52	18.1	34.0	0	100

Note: Resulting statistics are based on pooled sample of firms during the multiple survey periods, 2015–2017 and 2019–2020.
Source: Authors' estimates.

A detailed summary of the statistics is presented in Table 3.4.

Firm-level characteristics. The independent variables forming the baseline model include firm size, firm age, annual sales, foreign ownership dummy, female ownership dummy, industry, and the income classification of the country where the company operates. Firm size is a categorical variable taking the value of 1 for micro and small enterprises, 2 for medium-sized firms, and 3 for large firms. The size of firm employment also takes on a categorical value for consistency purposes across the surveys. The value of 1 denotes employment size ranging from 1 to 99, 2 refers to employee count of 100–199, and 3 denotes firms employing 200 persons and more. Age of firm is another categorical variable with 3 values: 1 for firms established for 10 years or less, 2 for firms in operation for 11–30 years, 3 for firms operating for more than 30 years.

A company's financial health and banking relationship also helps explain their incidence of trade finance rejections. This information is measured by firms' responses to survey questions asking them which factor they think caused the rejection of their trade finance applications. Dummy variables take the value of 1 if a firm responds that

Table 3.4: Summary Statistics

Variables	No. of Observations	Mean	Std. Dev.	Min	Max
Rejection rate, % of trade finance applications	1,466	19.4	33.6	0.0	100.0
Firm size	2,397	1.6	0.6	1	3
Employment size	2,353	1.2	0.5	1	3
Sales (log)	1,951	11.9	3.3	0.0	23.4
Age of firm	1,278	1.5	0.7	1	3
Industry	2,466	2.2	0.8	1	3
Foreign ownership dummy	2,033	0.1	0.3	0	1
Female ownership dummy	2,004	0.5	0.5	0	1
Company financial health and structure (dummy)					
Insufficiency of collateral and guarantee	2,604	0.2	0.4	0	1
Lack of formal documentation	2,604	0.1	0.2	0	1
Lack of business relationship with financial institutions	2,604	0.1	0.3	0	1
Lack of credit and financial performance history	2,604	0.1	0.3	0	1
Country-specific factors					
World Bank country income classification	2,604	0.6	0.7	0	2
Financial development index	2,494	0.3	0.2	0.1	1.0
Basel AML index	2,335	6.0	1.0	1.8	8.5
Use and/or consideration of using digital or web-based financial instruments (dummy)					
Crowdfunding	1,680	0.2	0.4	0	1
Peer-to-peer lending	1,703	0.3	0.4	0	1
Debt-based securities	1,622	0.2	0.4	0	1
Others	1,045	0.2	0.4	0	1

AML = anti-money laundering.

Note: Resulting statistics are based on pooled sample of firms during the multiple survey periods, 2015–2017 and 2019–2020.

Source: Authors' estimates.

(i) it has insufficient collateral and guarantee, (ii) it lacks required formal documents, (iii) it lacks business relationships with financial institutions, and (iv) it lacks credit and financial performance history. The lack of formal documentation, formal financial information, and assets that can be used as collateral or guarantee categorizes smaller firms as risky borrowers, explaining the huge discrepancy relative to larger companies.

Financial development and sovereign risks. Following the literature associating the level of financial development with the trade finance gap, empirical analysis adds a financial development index from the baseline trade finance rejection model. The index is sourced from the International Monetary Fund[4] and measures how developed financial institutions and financial markets are in over 180 countries. The literature also identifies the influence of country risk on access to trade finance. The analysis uses the Basel AML Index, which assesses the risk of money laundering and terrorist financing in over 140 countries.[5]

Fintech use. The recent waves of the survey also gather information on firms' awareness and use of available digital or web-based financing instruments including crowdfunding, peer-to-peer lending, invoice financing, and debt-based securities. Dummy variables corresponding to each fintech-related instrument are added to the model to evaluate the role each plays in serving the trade finance needs of smaller businesses. Note that this is a weak proxy for fintech use because not all who considered using fintech-assisted trade finance actually used it. The latter information cannot be generated from the dataset.

3.4.2 Limitations

The analysis and corresponding results have limitations. As far as the framework is concerned, the baseline model does not take into account the interaction of firms with their confirming and issuing banks. The export potential of firms supported by trade finance is influenced by the overall health of banks providing them needed financing (Amiti and Weinstein 2011). In addition, the rejection outcome of firms may be induced by their banks' internal structure including fund availability. This factor is less of a concern considering that many of the firms are indirect exporters (ADB and UNESCAP 2019). There is also a drawback

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[4]   Data can be accessed via the International Monetary Fund's Financial Development Index Database: https://data.imf.org/?sk=F8032E80-B36C-43B1-AC26-493C5B1CD33B.

[5]   Detailed discussion on the data can be found on the Basel Institute on Governance's Basel AML Index website: https://baselgovernance.org/basel-aml-index.

from using cross-sectional data in analysis because this method fails to capture the complexity and intertemporal dynamics within firms.

3.4.3 Discussion of Findings

Smaller firms experience higher incidence of trade finance rejections relative to larger firms. From Column 1 in Table 3.5, it is evident that the rejection rates are relatively higher for smaller companies among those seeking trade finance, keeping all other factors constant. Rejection rates among micro and small enterprises are, on average, 11.8 percentage points higher than those of medium enterprises, and 21.1 percentage points higher than those of large enterprises. It is also interesting to note that rejection rates are relatively lower among firms in high-income countries. This result can be attributed to country-level factors such as risk rating and the overall financial system, both of which are more favorable in advanced and richer economies. Because of the low representation of sample firms, the dummy variable with respect to operating within the CAREC region returns statistically insignificant results, which is in contrast with the descriptive statistics showing higher rejection rates among firms in the region.

The results from Column 2 validate the baseline finding that trade finance rejection rates vary by firm size, often disproportionately affecting smaller companies. Replacing firm size categories with the number of employees, the results, albeit statistically insignificant, suggest that companies with more employees have generally experienced lower rejection rates. The addition of annual sales as one of the explanatory variables further strengthens the evidence, i.e., companies generating larger revenues have lower rejection rates. Banks and other financial service providers tend to approve applications from financially viable firms, thus reducing the risk they bear for such transactions. A similar finding on country-income classification is observed. Meanwhile, the addition of a sales variable to the firm size category leads to rather ambiguous estimates on large firms. Note that the firm size category correlates strongly with sales considering that in some countries firms are classified by size based on sales revenue in lieu of number of employees.

Table 3.5 also suggests the absence of systematic variations in trade finance rejection rates in terms of a firm's age, foreign ownership, and sector. The estimates, however, give inconclusive indications that more mature firms have lower rejection rates relative to younger firms. The baseline model satisfies the conventional diagnostic test given in Wald chi-square, justifying the use of the Heckman selection model in analyzing the data. The inverse Mills ratio indicates the presence of negative selection that could result in a downward-biased estimate if sample selection is not properly corrected.

Table 3.5: Trade Finance Rejection Model Results

Dependent Variable: Trade Finance Rejection Rate	(1)	(2)	(3)
Firm size (Base: Micro and small enterprises)			
Medium enterprise	−11.846***		−8.112***
	(2.831)		(3.031)
Large enterprise	−21.133**		−14.484
	(9.403)		(9.569)
Number of employees (Base: 1–99 employees)			
100–199 employees		−7.284	
		(7.019)	
200 employees and above		−10.788	
		(7.541)	
Annual sales (log)		−1.630***	−1.317***
		(0.465)	(0.488)
Age of firm (Base: 10 years or less)			
11–30 years	0.005	1.275	1.421
	(2.992)	(3.023)	(3.023)
More than 30 years	−8.949	−4.647	−6.004
	(5.739)	(5.853)	(5.755)
Foreign ownership dummy (1 for firms with foreign ownership, 0 for domestic firms)	6.568	5.261	6.141
	(5.457)	(5.475)	(5.538)
Female ownership dummy (1 if firm is owned or founded by a woman, 0 otherwise)	−4.500	−4.904	−5.050*
	(2.952)	(2.986)	(2.985)
Sector (Base: Agriculture and mining)			
Manufacturing	−5.609	−3.784	−3.631
	(5.513)	(5.678)	(5.668)
Services	−0.080	−2.328	−1.333
	(3.137)	(3.148)	(3.146)
World Bank Country Income Classification (Base: Low and lower-middle income)			
Upper-middle income	−8.868***	−7.592**	−8.395***
	(3.234)	(3.232)	(3.245)
High income	−10.003**	−7.723*	−9.031**
	(4.267)	(4.254)	(4.266)
CAREC member countries	−2.061	−0.541	−0.609
	(6.935)	(7.118)	(7.091)

Table 3.5 *continued*

Dependent Variable: Trade Finance Rejection Rate	(1)	(2)	(3)
Constant	52.654***	66.527***	65.961***
	(4.554)	(7.263)	(7.217)
Inverse Mills ratio	−23.721***	−24.895***	−24.047***
Observations	1,112	1,098	1,100
Wald chi2	35.52	34.25	39.47
Prob > chi2	0.000	0.001	0.000

CAREC = Central Asia Regional Economic Cooperation.

Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Source: Authors' estimates.

Relatively weak company financial health and history among smaller firms significantly explain why their trade finance applications are more often rejected. Table 3.6 reveals that the trade finance rejections smaller firms are experiencing are highly associated with their lack of formal documentation, formal financial information, and assets that can be used as collateral or guarantee, making them appear as more risky borrowers than larger companies. The results could also reflect the general tendency of banks and other financial service providers to reject small-ticket transactions from smaller companies.

Also, worth noting from Table 3.6 is the consistent statistically significant variation in the rejection rates associated with the income classification of where the company operates. This observation likely indicates that there are existing country-level factors, which are highly associated with the country's level of development, and which put smaller firms from developing economies at a disadvantage in the current trade finance structure and system.

Adding the financial development index variable from the baseline trade finance rejection model using the MSME sample provides an intuitive explanation of the above observation. The addition of the variable resulted in ambiguous estimates for the World Bank country income classifications variable, particularly with the high income dummy, indicating a case of multicollinearity. The coefficient estimates before the financial development index, however, are intuitive and economically large despite being statistically not significant. Removing the World Bank income classification from the baseline model to address multicollinearity, the coefficient estimates have improved accuracy and

are statistically significant. This result suggests that the lower incidence of trade finance rejections in higher income countries, especially among smaller firms, can be explained by their well-developed financial systems.

Table 3.6: Company-Level Financial Health and Structure Driving Higher Trade Finance Rejection Rates among Micro, Small, and Medium-Sized Enterprises

Dependent Variable: Trade Finance Rejection Rate	(1) Insufficiency of Collateral and Guarantee	(2) Lack of Formal Documentation	(3) Lack of Business Relationship with Financial Institutions	(4) Lack of Credit and Financial Performance History
Company financial health and structure	36.438***	22.462***	16.978***	27.153***
	(2.757)	(4.219)	(3.692)	(3.984)
Annual sales (log)	−1.443***	−1.365***	−1.542***	−1.444***
	(0.413)	(0.464)	(0.464)	(0.455)
Age of firm (Base: 10 years or less)				
11–30 years	3.025	0.326	1.306	1.894
	(2.694)	(3.001)	(3.019)	(2.958)
More than 30 years	−3.392	−6.200	−4.361	−4.963
	(5.290)	(5.901)	(5.947)	(5.812)
Foreign ownership dummy (1 for firms with foreign ownership, 0 for domestic firms)	3.946	5.281	5.590	5.519
	(5.181)	(5.763)	(5.798)	(5.680)
Female ownership dummy (1 if firm is owned or founded by a woman, 0 otherwise)	−4.628*	−4.599	−5.118*	−3.392
	(2.696)	(3.003)	(3.021)	(2.967)
Sector (Base: Agriculture and mining)				
Manufacturing	−4.430	−3.740	−4.891	−5.122
	(5.069)	(5.709)	(5.745)	(5.606)
Services	−2.750	−2.091	−1.472	−2.642
	(2.800)	(3.129)	(3.151)	(3.082)

Table 3.6 *continued*

Dependent Variable: Trade Finance Rejection Rate	(1) Insufficiency of Collateral and Guarantee	(2) Lack of Formal Documentation	(3) Lack of Business Relationship with Financial Institutions	(4) Lack of Credit and Financial Performance History
World Bank Country Income Classification (Base: Low and lower-middle income)				
Upper-middle income	−4.804*	−8.148**	−8.097**	−9.289***
	(2.897)	(3.232)	(3.254)	(3.183)
High income	−5.216	−7.979*	−7.960*	−10.736**
	(3.840)	(4.256)	(4.281)	(4.209)
CAREC member countries	4.008	−2.809	−0.171	−0.288
	(6.394)	(7.167)	(7.201)	(7.038)
Constant	41.072***	58.744***	60.537***	57.149***
	(6.736)	(7.425)	(7.454)	(7.281)
Inverse Mills ratio	−11.531***	−23.208***	−23.964***	−20.659***
Observations	996	996	996	996
Wald chi2	211.50	57.68	50.23	76.94
Prob > chi2	0.000	0.000	0.000	0.000

CAREC = Central Asia Regional Economic Cooperation.
Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.
Source: Authors' estimates.

Table 3.7: Country-Specific Drivers of Higher Trade Finance Rejection Rates Among Micro, Small, and Medium-Sized Enterprises

Dependent Variable: Trade Finance Rejection Rate	(1) Financial Development Index	(2) Financial Development Index	(3) Basel AML Index
Country-specific factors	−12.418	−16.957**	0.651
	(12.017)	(8.309)	(1.544)
Annual sales (log)	−1.517***	−1.540***	−1.392***
	(0.485)	(0.482)	(0.481)

Table 3.7 *continued*

Dependent Variable: Trade Finance Rejection Rate	(1) Financial Development Index	(2) Financial Development Index	(3) Basel AML Index
Age of firm (Base: 10 years or less)			
11–30 years	0.557	0.640	–2.957
	(3.125)	(3.099)	(3.205)
More than 30 years	–5.449	–6.202	–7.325
	(6.121)	(6.133)	(6.306)
Foreign ownership dummy (1 for firms with foreign ownership, 0 for domestic firms)	4.123 (6.123)	3.224 (6.120)	6.564 (6.027)
Female ownership dummy (1 if firm is owned or founded by a woman, 0 otherwise)	–5.094 (3.108)	–5.447* (3.117)	–4.286 (3.246)
Sector (Base: Agriculture and mining)			
Manufacturing	–4.536	–4.771	–1.897
	(5.936)	(5.971)	(6.001)
Services	–2.103	–2.326	0.907
	(3.244)	(3.258)	(3.346)
World Bank Country Income Classification (Base: Low and lower-middle income)			
Upper-middle income	–7.743**		
	(3.534)		
High income	–4.920		
	(6.303)		
CAREC member countries	–1.082	2.825	7.133
	(8.044)	(7.828)	(7.050)
Constant	68.087***	66.205***	50.996***
	(7.530)	(7.523)	(12.510)
Inverse Mills ratio	–26.031***	–27.393***	–24.766***
Observations	982	982	925
Wald chi2	28.14	23.00	17.82
Prob > chi2	0.003	0.006	0.037

AML = anti-money laundering, CAREC = Central Asia Regional Economic Cooperation.
Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Source: Authors' estimates.

Meanwhile, in Column 3, it remains ambiguous how country risk influences trade finance rejection incidence among smaller companies. The results are based on the Basel AML Index, which assesses the risk of money laundering and terrorist financing in over 140 countries. The results give an inconclusive indication that a higher country risk where the company operates leads to higher rejection rates among smaller firms, other factors remaining constant.

The use of fintech could aid in lowering the incidence of trade finance rejections disproportionately experienced by smaller firms. The application of technology to the trade finance ecosystem has the potential to advance financial inclusion. This appears to be how results from Table 3.8 can be interpreted, albeit with some limitations. Using the MSME sample, the baseline equation adds the variable indicating the knowledge and use of digital or web-based financing instruments of firms. Consulting the literature on fintech, the hypothesis from this exercise is to observe a negative coefficient attached to the variable added. Despite a low level of fintech use, especially among smaller firms, Table 3.8 gives some indication—though not statistically significant—that MSMEs that have considered and/or used crowdfunding and/or debt-based securities typically available in web-based or digital platforms exhibited lower rejection rates, other factors remaining constant.

Table 3.8: Fintech Use and Trade Finance Rejection Rates among Micro, Small, and Medium-Sized Enterprises

Dependent Variable: Trade Finance Rejection Rate	(1) Crowdfunding	(2) Peer-to-Peer Lending	(3) Debt-Based Securities	(4) Others
Use and/or consideration of fintech–enabled trade finance	−2.618	1.555	−4.791	3.653
	(3.211)	(3.201)	(3.411)	(3.803)
Annual sales (log)	−2.188***	−2.090***	−2.039***	−2.045***
	(0.548)	(0.527)	(0.577)	(0.652)
Age of firm (Base: 10 years or less)				
11–30 years	0.712	1.422	2.002	3.411
	(3.379)	(3.361)	(3.457)	(4.061)
More than 30 years	−5.325	−6.233	−5.275	−7.595
	(6.867)	(6.549)	(7.047)	(8.209)

Table 3.8 *continued*

Dependent Variable: Trade Finance Rejection Rate	(1) Crowdfunding	(2) Peer-to-Peer Lending	(3) Debt-Based Securities	(4) Others
Foreign ownership dummy (1 for firms with foreign ownership, 0 for domestic firms)	6.891	6.631	6.250	9.226
	(6.276)	(6.359)	(6.324)	(7.509)
Female ownership dummy (1 if firm is owned or founded by a woman, 0 otherwise)	–5.482	–5.709*	–5.502	–4.451
	(3.348)	(3.356)	(3.423)	(3.923)
Sector (Base: Agriculture and mining)				
Manufacturing	–5.020	–5.123	–6.090	–4.656
	(6.026)	(6.068)	(6.151)	(6.804)
Services	–1.792	–0.896	–2.681	–0.994
	(3.514)	(3.469)	(3.574)	(4.241)
World Bank Country Income Classification (Base: Low and lower-middle income)				
Upper-middle income	–8.033**	–8.128**	–7.574**	–9.146**
	(3.623)	(3.641)	(3.729)	(4.276)
High income	–9.780**	–8.064*	–7.441	–9.861
	(4.846)	(4.853)	(4.920)	(6.125)
CAREC member countries	–0.714	0.232	–1.044	–3.657
	(7.735)	(8.058)	(8.023)	(8.780)
Constant	74.534***	71.770***	73.425***	69.337***
	(8.312)	(8.282)	(8.605)	(9.773)
Inverse Mills ratio	–22.557***	–23.998***	–22.296***	–18.821***
Observations	907	925	884	766
Wald chi2	31.99	30.22	28.62	24.69
Prob > chi2	0.001	0.001	0.003	0.010

CAREC = Central Asia Regional Economic Cooperation.
Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Source: Authors' estimates.

It must be noted from Table 3.8 that the coefficients of the country income classification variable remain statistically significant even after adding the fintech use/knowledge variable. Intuitively, such an observation indicates that the systematic variation in incidence of trade

finance rejections of countries across levels of development reflects the general structure of the financial system, including the availability of fintech solutions. This empirical observation implies that countries should gear their financial system to be compatible with digital solutions to improve financial inclusion.

There are various ways fintech is designed to overcome challenges that have disproportionately affected smaller businesses in accessing trade finance. Big data analytics and artificial intelligence reduce the costs borne by financial service providers in analyzing MSMEs' financial information and making credit decisions even without such pertinent information. The costs are relatively high when transacting with smaller businesses considering the small amount and infrequent transactions involved. Lee, Yang, and Kim (2019) argue that fintech could improve the efficiency of supply chain finance by reducing the probability of misclassifying good firms as bad.

Table 3.9 displays the empirical results evaluating some potential channels through which the use of digital platforms in trade finance could alleviate the incidence of rejections among smaller companies. Largely depending on data availability, the analysis empirically tests the interaction term between the firm's use and/or consideration of tech-enabled trade finance and reported financially related issues. The expected coefficient of the interaction term is negative, i.e., the use of fintech is associated with lower incidence of rejection by overcoming the specific company's financially related challenges. Again, types of tech-enabled trade finance in the exercises are: (a) crowdfunding, (b) peer-to-peer lending, (c) debt-based securities, and (d) others. Financial issues include: (a) insufficiency of collateral and guarantee, (b) lack of formal documentation, (c) lack of business relationship with financial institutions, and (d) lack of credit and financial performance history.

While the results remain ambiguous, the insights that could be drawn are clear. Fintech's potential to repress the rationing of smaller companies from the trade finance ecosystem is apparent. Many of the coefficients of the interaction terms are expectedly negative, although not statistically significant.

Table 3.9: Channels of Fintech Impact on Trade Finance Rejection Rates Among Micro, Small, and Medium-Sized Enterprises

a. Crowdfunding

Dependent Variable: Trade Finance Rejection Rate	(1) Insufficiency of Collateral and Guarantee	(2) Lack of Formal Documentation	(3) Lack of Business Relationship with Financial Institutions	(4) Lack of Credit and Financial Performance History
Use and/or consideration of fintech-enabled trade finance	–1.084	–1.764	–5.745*	–1.665
	(3.484)	(3.382)	(3.485)	(3.269)
Company financial issues	37.078***	21.299***	15.148***	29.735***
	(3.741)	(5.890)	(5.224)	(5.410)
Interaction term	–2.478	–6.647	9.493	–1.023
	(5.772)	(9.223)	(7.720)	(8.726)
Constant	44.031***	66.327***	66.961***	63.420***
	(7.678)	(8.404)	(8.220)	(8.080)
Other explanatory variables	Yes	Yes	Yes	Yes
Inverse Mills ratio	–8.714**	–20.476***	–19.867***	–17.745***
Observations	907	907	907	907
Wald chi2	189.40	50.22	60.69	82.01
Prob > chi2	0.000	0.000	0.000	0.000

Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Source: Authors' estimates.

b. Peer-to-Peer Lending

Dependent Variable: Trade Finance Rejection Rate	(1) Insufficiency of Collateral and Guarantee	(2) Lack of Formal Documentation	(3) Lack of Business Relationship with Financial Institutions	(4) Lack of Credit and Financial Performance History
Use and/or consideration of fintech-enabled trade finance	–1.870	–2.590	–0.302	–0.756
	(3.481)	(3.320)	(3.430)	(3.292)
Company financial issues	32.728***	9.662	14.566**	22.239***
	(4.326)	(7.532)	(5.937)	(6.652)
Interaction term	5.278	18.958**	7.393	8.386
	(5.695)	(9.283)	(7.898)	(8.456)

Table 3.9 *continued*

Dependent Variable: Trade Finance Rejection Rate	(1) Insufficiency of Collateral and Guarantee	(2) Lack of Formal Documentation	(3) Lack of Business Relationship with Financial Institutions	(4) Lack of Credit and Financial Performance History
Constant	46.644***	64.439***	65.159***	60.820***
	(7.698)	(8.254)	(8.240)	(8.138)
Other explanatory variables	Yes	Yes	Yes	Yes
Inverse Mills ratio	−9.907**	−20.426***	−21.088***	−18.332***
Observations	925	925	925	925
Wald chi2	184.40	60.79	55.16	76.60
Prob > chi2	0.000	0.000	0.000	0.000

Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.
Source: Authors' estimates.

c. Debt-Based Securities

Dependent Variable: Trade Finance Rejection Rate	(1) Insufficiency of Collateral and Guarantee	(2) Lack of Formal Documentation	(3) Lack of Business Relationship with Financial Institutions	(4) Lack of Credit and Financial Performance History
Use and/or consideration of fintech-enabled trade finance	−2.090	−3.738	−5.501	−4.148
	(3.676)	(3.583)	(3.704)	(3.530)
Company financial issues	37.747***	23.918***	19.341***	30.676***
	(3.605)	(5.850)	(4.831)	(5.197)
Interaction term	−4.463	−12.941	0.797	−4.598
	(6.212)	(9.591)	(8.290)	(8.961)
Constant	42.196***	65.424***	65.152***	60.809***
	(7.903)	(8.643)	(8.534)	(8.399)
Other explanatory variables	Yes	Yes	Yes	Yes
Inverse Mills ratio	−8.906**	−20.154***	−19.980***	−17.673***
Observations	884	884	884	884
Wald chi2	181.60	48.28	54.86	77.95
Prob > chi2	0.000	0.000	0.000	0.000

Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.
Source: Authors' estimates.

Table 3.9 *continued*

d. Other Digitally Enabled Financial Products

Dependent Variable: Trade Finance Rejection Rate	(1) Insufficiency of Collateral and Guarantee	(2) Lack of Formal Documentation	(3) Lack of business Relationship with Financial Institutions	(4) Lack of Credit and Financial Performance History
Use and/or consideration of fintech-enabled trade finance	−0.363	4.051	1.599	4.027
	(4.233)	(3.989)	(4.146)	(3.933)
Company financial issues	36.314***	14.250*	12.484**	33.420***
	(4.983)	(8.148)	(6.182)	(7.548)
Interaction term	0.224	−4.293	11.704	−7.222
	(6.936)	(11.753)	(9.319)	(10.568)
Constant	46.957***	64.684***	63.191***	58.597***
	(8.907)	(9.970)	(9.751)	(9.508)
Other explanatory variables	Yes	Yes	Yes	Yes
Inverse Mills ratio	−6.719	−17.811***	−16.370***	−13.956***
Observations	766	766	766	766
Wald chi2	131.40	29.32	41.76	58.82
Prob > chi2	0.000	0.006	0.000	0.000

Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Source: Authors' estimates.

The empirical literature on fintech use and its impact on financial inclusion remains limited. The results from these exercises serve as additional evidence on how useful fintech could be to bridge the gap in trade finance. To draw further policy insights, knowledge gaps need to be addressed in this area of empirical research by linking firm-level financial health information with firms' trade finance experiences.

3.5 Policy Implications: Leveraging Fintech in Narrowing the Trade Finance Gap in CAREC

Based on the latest assessment of the extent to which alternative finance promotes financial inclusion, the CAREC region has a lot more to do, especially in serving the unserved and underserved market needs for

adequate finance. Asking debt-based platform respondents to indicate the banking status of their borrower-customer base, i.e., unbanked, underbanked, and banked, Ziegler et al. (2021) found that only 2% of the borrowers/customers that are unbanked are provided with credit in South and Central Asia, relatively lower compared to Southeast Asia's 9%, which is close to Oceania, also about 9% (Figure 3.12). It is interesting to note though that a large proportion of the borrowers/customers being served are underbanked in South and Central Asia (45%), comparable with Southeast Asia (50%).

Figure 3.12: Banking Status of Borrower/Customer Base of Alternative Finance Industry in Asia and the Pacific by Subregion, 2020

Source: Authors' illustration using information from the Cambridge Centre for Alternative Finance Global Alternative Finance database.
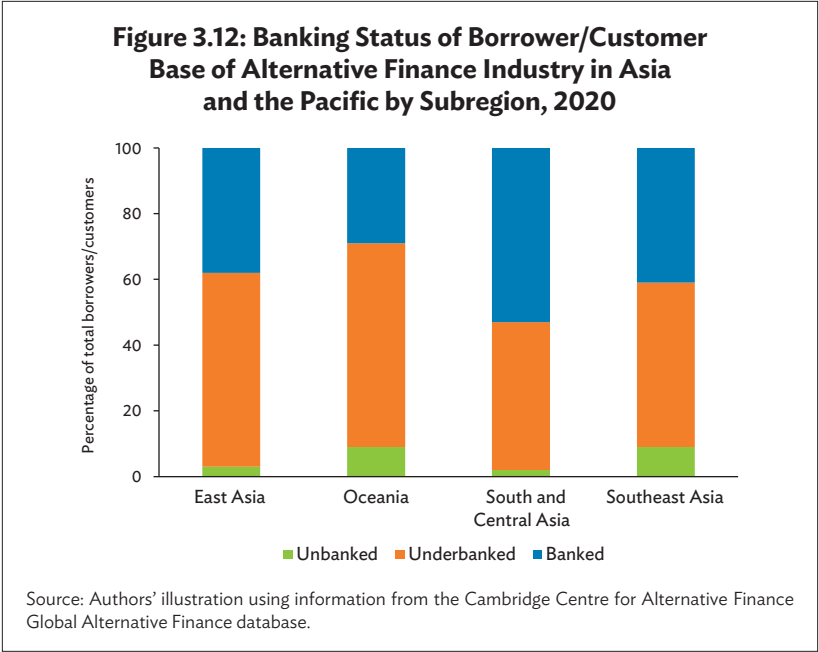
To examine how fintech applies to solving the trade finance gap issue of the region, it is important to determine the environment in which fintech could flourish. Fintech credit is more prominent in richer countries, with their less competitive banking systems, as well as less stringent banking regulation (Claessens et al. 2018). Meanwhile, Rau (2020) finds that crowdfunding volumes are greater among larger economies, especially those with strong regulatory regimes and more efficient legal systems.

For the CAREC region to effectively harness fintech to address the trade financing needs of MSMEs, member countries need to further develop their financial, regulatory, and technology infrastructures, and make them consistent with international best practices now in vogue in countries with advanced fintech systems.

3.5.1 Strengthen Fundamental Growth Pillars of Fintech and Application to Trade Finance

Taking the case of the PRC, a three-stage fintech upgrade (Figure 3.13) has made the country global leader in the fintech ecosystem. Efforts should start from transforming the traditional financial services industry with the introduction of information technology to digitize and automate business processes. These changes could lead to improved management and operations efficiency. At the next stage, financial service providers should be encouraged to build online platforms, leveraging the internet to collate users and information to enable information sharing. Lastly, there should be a focus on integrating different new technologies to reorganize traditional financial services such as financial information collection, financial risk management, and investment decision making, among other financial intelligence. In general, fintech development follows a phased track leading to improvement in the efficiency of providing traditional financial services.

Figure 3.13: Stages of Fintech Upgrade and Development

Fintech 1.0

Information technology implementation in the backroom processes

Fintech 2.0

Internetisation of front-end service channels

Fintech 3.0

Reforming technology adoption in the whole financial services value chain

Source: Sinai Lab et al. (2020).
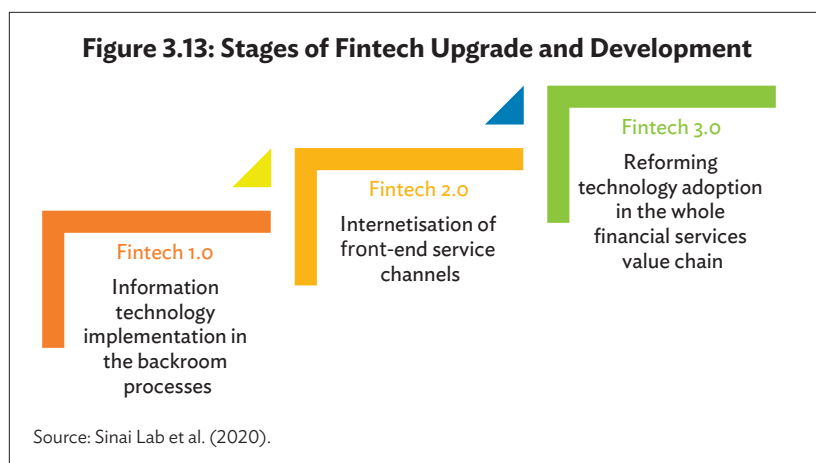
In the Global FinTech Hub Report 2020, market, technology, and regulations are the three apparent forces leading toward the fintech development of global fintech leaders, including the PRC, United States, and United Kingdom (Sinai Lab et al. 2020).[6] The PRC's success is largely driven by its large consumer base embracing technological advances in financial services. The United States has benefitted from technological revolutions while building adequate and relevant infrastructures. The success of the United Kingdom, meanwhile, hinges largely on regulatory innovations, focusing on improving the regulatory systems and ecosystem.

In the short to medium term, CAREC member countries should strengthen focus on fundamental growth pillars of fintech. One critical element for establishing a solid fintech ecosystem is the availability of adequate human resources, which involves hiring, training, and retaining the best talent. Member countries should accelerate the training of the skilled fintech labor force in partnership with recognized higher education and research institutions. Kazakhstan, for its part, has been proactive in developing talent in sectors related to fintech and information and communication technology (ICT), e.g., with the launch of a programming school, QWANT.[7]

The region needs to further bolster the ICT and digital infrastructures. The region's growing mobile and broadband use and internet penetration (Figure 3.14) can be leveraged for the growth of fintech and other digital financing solutions. The volume of digital payments in Kazakhstan increased more than 2 times in 2019, which amounted to $34.9 billion, largely attributed to the development of infrastructure of trading point-of-sale terminals and the market entry of Apple Pay and Samsung Pay, as well as aggressive promotion of the active use of cashless payments (Davletov et al. 2020). E-commerce also exhibits steady expansion led by Kazakhstan and Uzbekistan. Introducing ICT and digital improvements is particularly relevant in Asia, where 95% of banks are running on outmoded core banking technology,[8] hindering innovation that could reduce costs. The imposed technology gap for infrastructure is increasing banks' cost-to-income (C/I) ratios by 3–5%.

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[6]   The digitalization rate of the traditional financial sector among global fintech leaders is relatively high, including the overall digital infrastructure comprising cybersecurity and internet adoption as well as research capacity. The global fintech leaders have a relatively more supportive policy environment toward fintech.

[7]   QWANT is a totally online tech school that currently focuses on software engineering, data science, and full stack development.

[8]   The average age of core banking technology in Asia is estimated at 20 years or more.

**Figure 3.14: Information and Communication Technology
Infrastructure Landscape in CAREC, 2007–2018**

a. Percentage of individuals
using the internet

b. Mobile-cellular telephone subscriptions
per 100 inhabitants

c. Fixed-broadband subscriptions
per 100 inhabitants

Afghanistan	Azerbaijan	Georgia
Kazakhstan	Kyrgyz Rep.	Mongolia
Pakistan	PRC	Tajikistan
Turkmenistan	Uzbekistan	
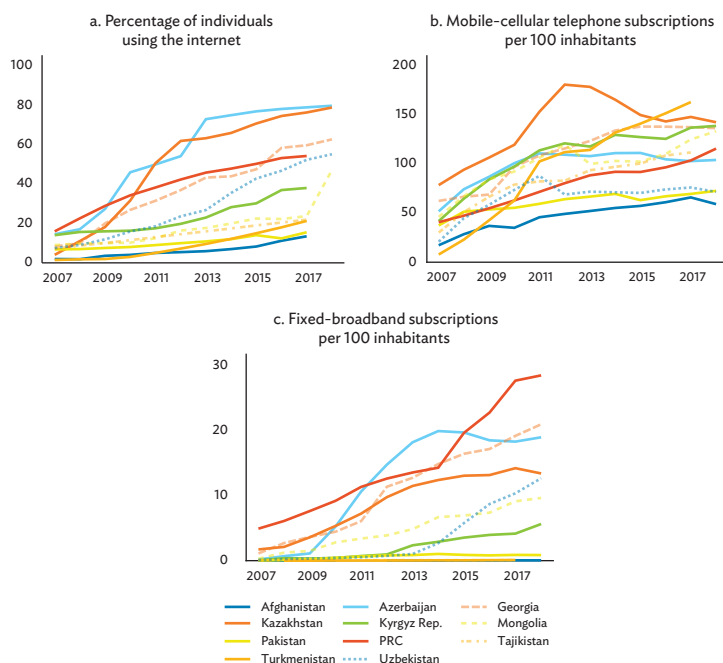
PRC = People's Republic of China.

Source: Authors' illustrations using data from ITU's World Telecommunication/ICT Indicators Database.

The digitalization of trade finance makes processes and applications more efficient, reliable, and attractive, while reducing errors, maintaining data integrity, and accelerating the completion of agreements (Schaefer 2017). For example, e-docs streamline processes by allowing multiple parties to access, review, and collaborate simultaneously.

To digitalize trade finance, the region should consider upgrading its efforts to facilitate digital trade, shifting away from conventional trade clearing procedures alongside successful implementation of paperless trade. Initiatives like e-phyto certification, national single window, and easing customs clearance procedures at borders have already kicked off. Such efforts may bring down the cost (time delays and payments) at border crossing points, which remains high in

Pakistan and Afghanistan. Greater use of cross-border paperless trade can help SMEs reach global markets and compete internationally (ADB and UNESCAP 2019).

CAREC member countries should ensure regulatory quality (e.g., cybersecurity and other technical vulnerabilities, data governance, and privacy protection) and regionwide consistency. Across Asia and the Pacific, cybersecurity breaches are consistently cited by alternative finance players as the major risk that needs to be tamed (Ziegler et al. 2021). In East Asia, excluding the PRC, 47% of the respondents reported the cybersecurity risk as high or very high, followed by Oceania (45%) and Southeast Asia (34%). Fintech firms are also concerned about uncertainty surrounding changes in regulation as another major risk that could potentially hamper the further growth of the alternative finance industry in Asia and the Pacific.

Large knowledge gaps are hindering companies and economies from getting the most out of this form of finance, alongside other impediments that include high costs, inefficient processes, high information asymmetry, and e-commerce regulations that are too stringent. Because the fintech revolution is new, the proliferation of competing platforms complicates its financial infrastructure because as yet there are no standardized processes or procedures. Consider, for example, a situation where a small company uses one type of platform, but its trading counterparty uses a different platform. Clearly, situations such as this will have a negative impact on digital trade.

3.5.2 Forge Deeper Strategic Collaboration through the CAREC Program

From a regional cooperation perspective, there is a need to strengthen regulatory structures and ensure that they are sufficiently harmonized across CAREC countries despite differences in the levels of fintech sophistication.

The CAREC program can be a platform to support member countries to achieve legal and regulatory harmonization while fostering knowledge and policy dialogue to strengthen access to finance by promoting a regional CAREC market based on fintech. In partnership with ADB and CAREC Institute, the CAREC program—through the Regional Trade Group, which is the lead consultative and coordinating body with full operational authority over CAREC work on trade—plans to develop a concrete roadmap for accelerated progress of fintech including the possible establishment of a financial innovation hub in the region to further develop expertise and drive innovation in the regional

financial sector. In particular, the roadmap will discuss the institutional and legal frameworks needed to ensure consistent application of fintech across CAREC members.

To facilitate expansion of fintech in the region, regulators and policy makers in different jurisdictions would need to cooperate to create a "cross-border regulatory sandbox" or to introduce a "fintech passport" to promote financial innovation and regionwide fintech development. A forum could be initiated as a regular network of CAREC member countries to improve cooperation and coordination of national regulatory bodies in support of the growth of the fintech industry similar to the Association of Southeast Asian Nations Financial Innovation Network, which is formed together with relevant partners and stakeholders.

3.6 Trade Finance in the Time of the COVID-19 Outbreak and the Role of Fintech

International trade transactions have become difficult to carry out during the COVID-19 pandemic because of disrupted shipping, in-person interactions, and travel. The pandemic has also affected trade finance processes in the areas of deal origination and distribution, negotiable instruments, document transmission, authorized signatures, and shipping (ICC 2020b). During the height of the pandemic-related restrictions in April 2020, most banks reported difficulties arising from the lack of staff (with 75–90% of operational staff working from home), the inability to print, and other logistical matters.

The COVID-19 pandemic and consequent movement restrictions provide a compelling case for adopting fintech—and, globally, the pandemic has spurred more firms to adopt digital platforms in trade and finance. The pandemic has created opportunities to further expand the role of fintech in financial inclusion in developing economies while preserving the resiliency of the global trading ecosystem.

Alternative procedures took place to settle trade finance transactions, with many players moving toward full or partial digitalization in terms of digital channels, electronic documents, electronic signatures, and new business processes and controls (ICC 2020b). Fintech can efficiently unlock new sources of finance for vulnerable groups that are underserved by banks and other traditional financial institutions. This includes providing new turnkey loan origination and underwriting platforms to allow banks and lenders to provide financing for small businesses. These platforms encompass risk assessment and insurance capabilities.

3.7 Concluding Remarks

The availability of trade and supply chain finance has enabled 80% to 90% of global trade. The current system, however, inadvertently falls short on the financing needs of even the viable transactions from smaller firms, especially from developing economies. The unmet demand for trade finance was estimated at $1.7 trillion in 2020. Amid the COVID-19 pandemic, the International Chamber of Commerce (2020a) expected the need for around $1.9 to $5.0 trillion in trade credit to facilitate a rapid recovery of global trade.

In 2020, about 2 in 5 of the respondent micro and small firms operating in the Central Asia Regional Economic Cooperation (CAREC) region saw their trade finance applications partially or totally rejected, and many of those firms were unable to seek alternative finance. Trade finance requests from smaller firms are often rejected due to high perceived costs, the risks associated with their insufficient collateral or guarantees, lack of a relationship with financial institutions, and insufficient credit or performance history. For lenders, smaller-ticket transactions involve high transaction and information costs of having to stringently comply with international regulations and standards, such as anti-money laundering and KYC.

This study works on the available firm-level microdata on ADB's Trade Finance Gaps, Growth, and Jobs Survey, and builds a cross-section of firms responding to the survey in years 2015–2017 and 2019–2020. Applying the Heckman two-step correction approach, the analysis validates that smaller firms experience a higher incidence of trade finance rejections relative to larger firms, owing largely to their weak company financial health and history. The lower incidence of trade finance rejections in higher-income countries can also be explained by their well-developed financial systems. Interestingly, the results indicate that the use of fintech could aid in lowering the incidence of trade finance rejections disproportionately experienced by smaller firms, advancing financial inclusion.

The permeation of digital technologies in financial services makes risk management more effective, facilitates transactions across larger distances and at a faster speed, allows transactions without having to rely on personal relationships, and increases transparency. The greater use of fintech in trade and supply chain finance aligns with ongoing efforts to support the further development of e-commerce while overcoming challenges related to COVID-19 restrictions.

The chapter maps the financial ecosystem in CAREC member countries and explores the potential opportunities and limitations of fintech adoption and entry points for intraregional cooperation. The

CAREC region—with the notable exception of the PRC—lags in the use of fintech, including its application for digitizing trade finance. In the PRC, 61% of digitally active SMEs use fintech, facilitated by the country's advances in developing and applying payment platforms and big data management. In terms of market size and number of platforms, the other CAREC member countries demonstrate relative infancy, requiring further advancements of financial, regulatory, and technology infrastructure.

In the short to medium term, CAREC member countries should focus on strengthening the fundamental growth pillars of fintech. The region needs to further bolster the ICT and digital infrastructures while ensuring regulatory quality involving cybersecurity and other technical vulnerabilities, data governance, and privacy protection. Specific to trade finance, the region should consider efforts to lower transaction costs steering away from conventional trade clearing procedures. Facilitating greater use of fintech in trade and supply chain finance is in line with ongoing efforts to step up support for the development of e-commerce in the region.

Learning from country-specific lessons, the CAREC region's fintech adoption and advancement should be based on efficient financial structures, effective regulatory frameworks, and the needed capabilities to advance inclusive trade and finance.

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Economic Dynamics and the COVID-19 Pandemic

4

Debt and Debt Sustainability in the CAREC Region

Naseem Faraz, Ghulam Samad, and Qaisar Abbas

4.1 Introduction

The global economic downturn due to the coronavirus disease (COVID-19) pandemic has affected trade and the domestic economies of the Central Asia Regional Economic Cooperation (CAREC) countries. For much of the first to third waves of the pandemic, international borders were sealed and flights completely banned, affecting global trade significantly. Countries integrated through global value chains (GVCs) have been more severely affected. The pandemic has led CAREC countries to impose restrictions using varying strategies depending on their domestic health care and economic situations.

The COVID-19 lockdown has had colossal economic consequences. Countries' efforts to "flatten the curve" have severely restricted economic activities. Output contraction continued even in the second wave of COVID-19 in the last quarter of 2020 as most countries were experiencing peaks in confirmed cases or were moving out of such peaks. The global economy contracted by roughly 4.9% in 2020 (IMF 2020b). Advanced economies have experienced growth rates of −8.0% in contrast with pre-COVID-19 targets of 1.7%, and emerging markets have experienced growth rates of −3.0% against pre-COVID-19 targets of 3.7%.

Input imports have also declined. For instance, in Pakistan, the export-oriented textile sector experienced a decline of roughly 21% in imported raw material. The demand for machinery, raw material, and other inputs also declined by 14% to 45% in various other sectors including transport, iron and steel, chemicals, and food. Parallel to this, the People's Republic of China (PRC) has shown a 20% fall in its trade. Due to lockdown measures, the trade costs of global imports and exports increased by 25% (WTO 2020). Remittances dropped by 25%

as activity in Gulf Cooperation Council countries declined. The fall in remittances, foreign investment, and input imports affected the demand and supply chains of businesses within the country. Unemployment at all levels including daily-wage, contract, and white-collar workers has increased. To support the workers and businesses and to keep the economy going, the government provided fiscal stimulus packages. The financial institutions were also experiencing huge demand and supply financial constraints in the country (see Box 4.1). All these disruption and mitigation policies led the government to raise debt to generate fiscal stimulus.

Box 4.1: Performance of Pakistan's Banking System Before and During the COVID-19 Shock

Pakistan's banking and financial system, led by the central bank (State Bank of Pakistan: SBP), has shown resilience in meeting the financial needs of the economy during the multi-faceted coronavirus disease (COVID-19) crisis. The range and swiftness of SBP policy responses to COVID-19 gave confidence to commercial banks, financial markets, and the wider economy by showing the government's readiness to meet the challenges of this difficult situation. This confidence is reflected in the steady improvement in banking system performance, with the impacts carrying over to the wider economy. This box analyzes Pakistan's banking system before and during COVID-19 and highlights the performance of key financial soundness indicators, which are given below.

Capital Adequacy

The Capital Adequacy Ratio[1] (CAR) of Pakistan's banking system has been well above the required minimum over the last 5 years (Figure B4.1). In fact, the Tier-1 CAR[2] is also above the required minimum for the same period. This is due to the high level of capital on banks' balance sheets. Also, banks have demonstrated fairly robust management of credit risk-weighted assets during economic downturns and rising nonperforming loans (NPLs) by reducing loans to weak borrowers.

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[1]   CAR is a risk-sensitive measure of assessing capital adequacy of Financial Institutions and is computed as the ratio of Total Eligible Capital to Total Risk Weighted Assets.

[2]   Defined as the ratio of a bank's Tier-1 capital to its total risk-weighted assets.

Box 4.1 *continued*

Figure B4.1: Capital Adequacy Ratios and Bank Capital, CY2016–Q3 CY2020

(PRe billion)

Legend:
- Tier-1 CAR (right)
- Tier-1 Capital (left)
- Tier-2 Capital (left)
- Maintained CAR (right)
- Required CAR (right)

X-axis: CY15, CY16, CY17, CY18, CY19, Q3CY20

Left axis: 0 to 2,000; Right axis: 0% to 20%
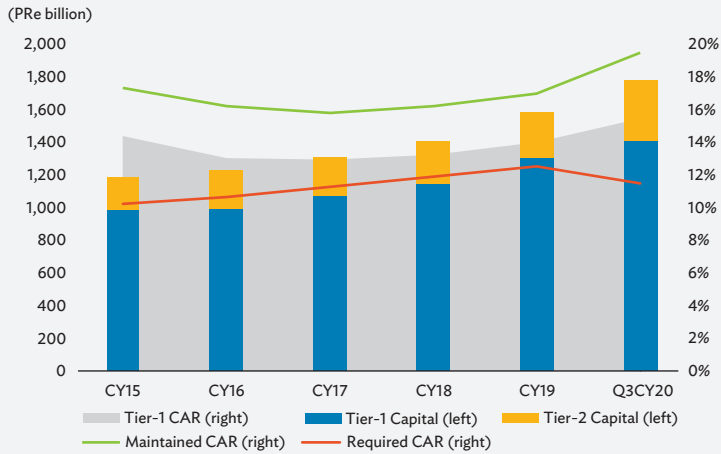
CAR = capital adequacy ratio.

Source: SBP.

Before COVID-19, the banking system CAR stood at 17% in December 2019, which is well above the required minimum of 12.5% at the same date (Figure B4.2). Tier-1 CAR also stood at 14%, a full 1.5% higher than the required minimum of 12.5%. After the onset of COVID-19 and strict lockdown measures in some parts of the country from 24 March 2020, SBP reduced the Capital Conservation Buffer[3] (CCB) for meeting CAR requirements from 2.5% to 1.5%, thereby further reducing the required minimum from 12.5% to 11.5%. The CCB was reduced to provide regulatory relief to banks in the wake of lockdown and the consequent shutdown in economic activity. Accordingly, the CAR of the banking system increased from 17% in December 2019 to 17.2% in March 2020. Subsequently, the banking system CAR increased to 18.7% in June 2020 and 19.5% in September 2020 due to regulatory relief provided by SBP and drastic

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[3] CCB is a regulatory framework that requires banks to build up buffer capital in good/normal times, which can be used as losses are incurred during stressed periods. CCB strengthens the ability of banks to withstand adverse economic environments. Implementation of the CCB framework helps increase banking sector resilience going into a downturn, and provides the mechanism for rebuilding capital during the early stages of economic recovery.

Box 4.1 *continued*

reduction in banks' credit risk-weighted assets. Both Tier-1 and total CAR have been strengthened due to SBP regulatory relief measures from March 2020 onward. Banks have responded well to SBP actions and have strengthened their CAR levels from March 2020 onwards to withstand any further shocks.

Figure B4.2: Capital Adequacy Ratios and Bank Capital, December 2019–September 2020

(PRe billion)

| Tier-1 CAR (right) | Tier-1 Capital (left) | Tier-2 Capital (left) |
| Maintained CAR (right) | Required CAR (right) | |

CAR = capital adequacy ratio.

Source: SBP.
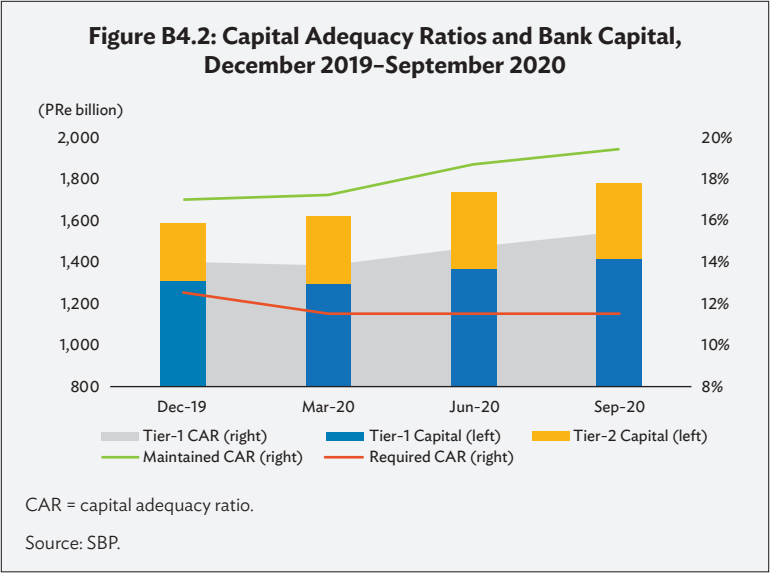
Banks' Balance Sheet Composition

An analysis of the banking system before COVID-19 shows that the flow of both advances and net investments increased in CY2016 and CY2017 (Figure B4.3). However, asset growth decelerated in CY2018 due to net maturity of long-term government bonds, while advances increased in CY2018. Deteriorating macroeconomic conditions in the latter half of CY2018 and the first half of CY2019 made banks risk-averse and increased their net investments in government bonds, while advances witnessed negative growth due to uncertain economic conditions, especially in the first half of CY2019. Stabilization measures by the government in the second half of CY2019 steadied the macroeconomic indicators but the disruption of economic activity due to COVID-19 in March 2020 led to banks consolidating their balance sheets. As a result, an already low level of advances decreased further in first 9 months of CY2020, whereas net investments in government bonds increased drastically over the same period. Banks strengthened their capital position by reducing advances to weak borrowers and by increasing

Box 4.1 *continued*

investments in zero-risk government bonds. As a result, banks have signaled that they are adequately prepared to deal with any further deterioration in economic activity due to COVID-19.

Figure B4.3: Breakdown of Total Asset Flows, CY2016–Q3 CY2020

(PRe trillion)

Source: SBP.
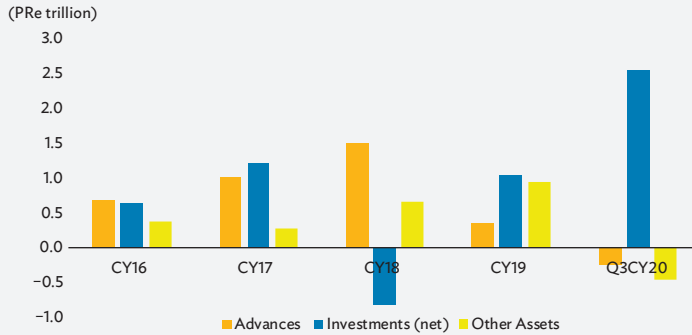
Banks have rebalanced their portfolios toward lower risk by increasing investment in government securities (Figure B4.4). Investments in government securities have increased from PRe0.8 trillion ($5.2 billion) to PRe2.3 trillion ($15.1 billion) from CY2019 to CY2020.

Figure B4.4: Investments in Government Securities—Flows, CY2016–Q3 CY2020

(PRe trillion)

Source: SBP.
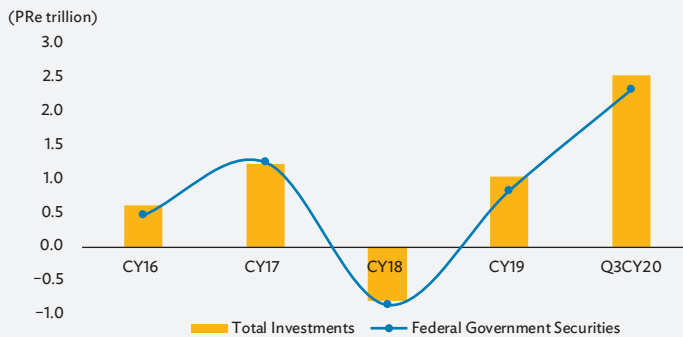
Box 4.1 *continued*

Advances to Borrowers

A comparison of sector-wise flow of advances before COVID-19 shows that in CY2016 and CY2017, advances to the textile, sugar, and agribusiness sectors increased. Due to the uncertain economic situation in CY2018, especially in the latter half of CY2018, advances to sugar and agribusiness decreased while advances to textiles increased due to the government's Textile Package of 2018[4] (Figure B4.5).

Figure B4.5: Sector-wise Flow of Advances, CY2016–Q3 CY2020

(PRe billion)

■ Textiles   ■ Sugar   ■ Financial   ■ Agribusiness   ■ Automobiles and transport

Source: SBP.
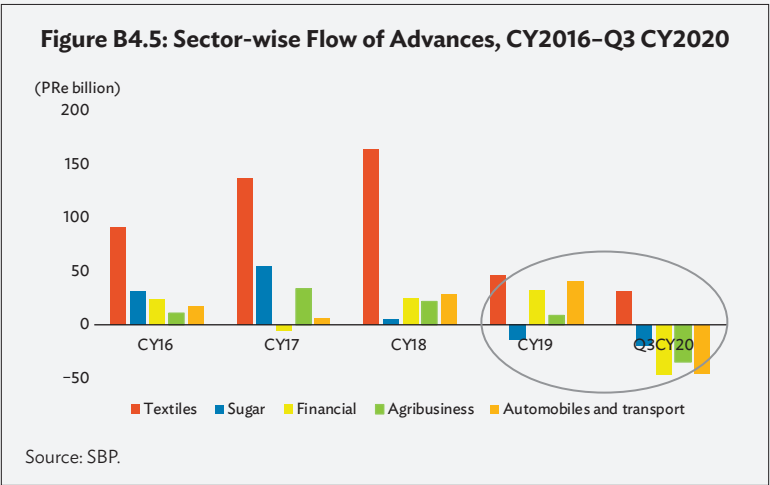
The government stabilization measures in CY2019 steadied the economy; however, the overall flow of advances remained low in CY2019, with those to the textile sector reducing after increasing for the last 3 years. Due to COVID-19, advances reduced drastically during first 9 months of CY2020 in the sugar, agribusiness, automobile and transport sectors, with only some lending to the textile sector (Figure B5.6).

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4   The Textile Package of 2018 was a set of policies introduced by the government to boost Pakistan's textile exports. The major incentives in this package were reduction in tariff rationalization surcharge, immediate payment of sales tax liability, custom duty drawback refunds, etc.

Box 4.1 *continued*

**Figure B4.6: Sector-wise Flow of Advances,
CY2019 and Q3 CY2020**

(PRe billion)

■ Textiles   ■ Sugar   ■ Financial   ■ Agribusiness   ■ Automobiles and transport

Source: SBP.
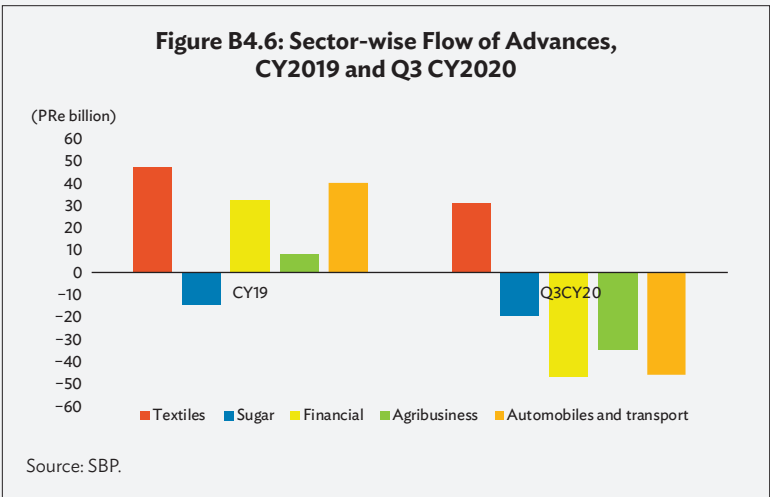
Analysis of segment-wise flow of advances before COVID-19 shows that advances to the Corporate and Consumer Finance sector increased from CY2016 to CY2018. However, due to the uncertain economic situation in the latter half of CY2018, and especially in the first half of CY2019, the flow of advances to both the Corporate and Consumer Finance sectors increased at a reduced rate in CY2019 (Figure B4.7).

Figure B4.7: Segment-wise Flow of Advances, CY2016–Q3 CY2020

(PRe billion)   (PRe billion)

■ SME (left)   ■ Consumer Finance (left)   ■ Commodity Financing (left)
■ Agriculture (left)   ●— Corporate (right)

Source: SBP.
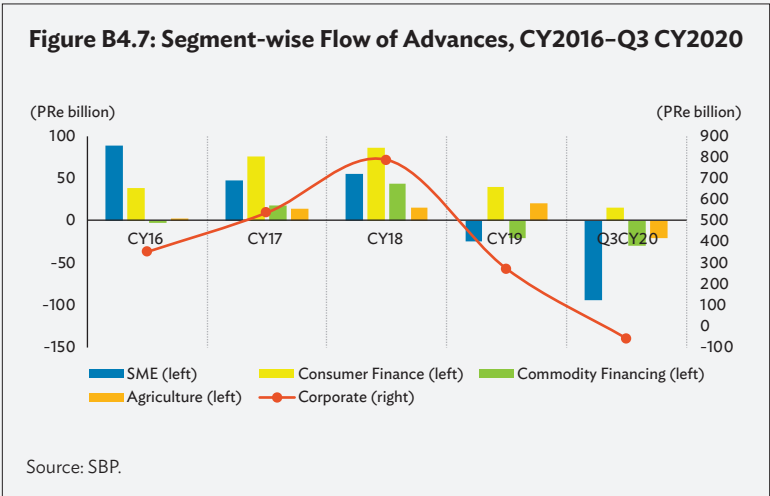
Box 4.1 *continued*

Due to the COVID-19 shock, the net flow of advances to the Corporate sector has remained negative in CY2020, i.e., borrowing to the Corporate sector has been lower as compared to the position in CY2019. On the other hand, net flow of advances for Consumer Finance during CY2020 has been positive but low. The flow of advances to the small and medium-sized enterprises[5] (SMEs) sector, on the other hand, was already slowing from CY2016 to CY2018; however, due to economic uncertainty in the latter half of CY2018 and the first half of CY2019, net flows to the SME sector have been negative in CY2019 and CY2020 as compared to CY2018 levels. Net flows to the agriculture sector were already low from CY2016 to CY2019 and turned negative in CY2020 due to COVID-19.

In terms of types of advances, borrowing for working capital increased drastically due to the low-interest rate environment in CY2018, even though there was some uncertainty in the overall economic conditions (Figure B4.8). In CY2020, working capital investment has largely decreased due to COVID-19 lockdowns while SBP's generous package for businesses has slightly increased long-term borrowing for fixed investments.

Banking system Advances to Deposit Ratio[6] (ADR) is a matter of concern, as it has hovered from 46% to 56% from CY2015 to CY2019 and currently stands at 45% in CY2020 (Figure B4.9). Given the precarious economic situation due to COVID-19 lockdowns, an ADR of 45% is understandable but not satisfactory for the banking system to facilitate financial intermediation.

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[5]   A small enterprise is a business entity, which does not employ (including contract employees) more than 50 persons, and annual sales turnover is up to PRe150 million ($1 million).

Small enterprises can be extended finances up to PRe25 million ($0.2 million).

A medium enterprise is a business entity, ideally not a public limited company, which employs (including contract employees) more than 50 employees and less than 100 employees in case of trading establishments. In cases of manufacturing and service establishments, they employ more than 50 employees (including contract employees) and less than 250 employees. For all medium enterprises, annual sales turnover is over PRe150 million ($1 million) and up to PRe800 million ($5.2 million).

Medium enterprises can be extended finances over PRe25 million ($0.2 million) to PRe200 million ($1.3 million).

[6]   The ADR is used to assess a bank's liquidity by comparing a bank's total loans to its total deposits for the same period. The ADR is expressed as a percentage. If the ratio is too high, it means that the bank may not have enough liquidity to cover any unforeseen fund requirements. Conversely, if the ratio is too low, the bank may not be earning as much as it could be.

Box 4.1 *continued*

Figure B4.8: Breakdown of Type of Advance—Flows, CY2016–Q3 CY2020

(PRe billion)

Source: SBP.
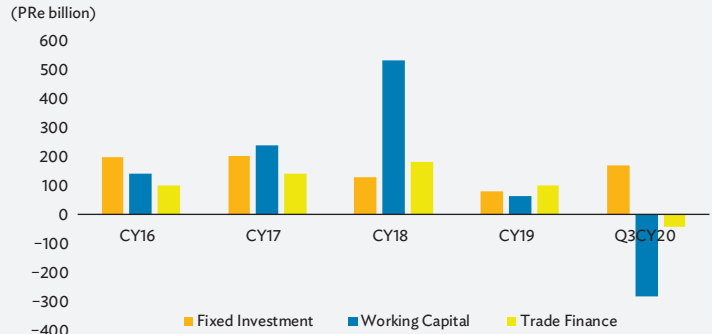
Figure B4.9: Advances to Deposit Ratio, CY2015–Q3 CY2020

(PRe trillion)

Source: SBP.
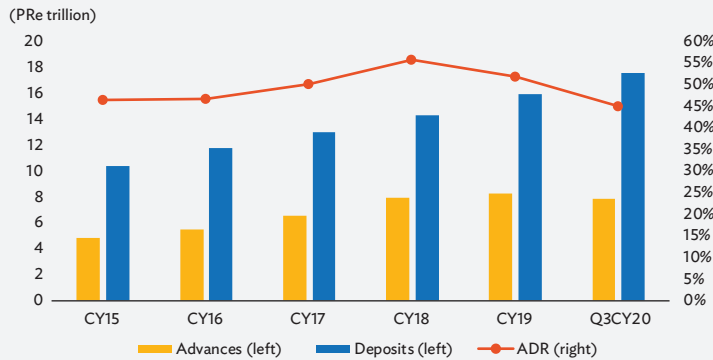
Box 4.1 *continued*

Nonperforming Loans

Nonperforming Loans[7] (NPLs) started increasing in CY2018 on account of deterioration in economic indicators and have increased by the same levels in CY2019 and up to Q3 CY2020 (Figure B4.10). NPLs have not increased drastically in first the 9 months of CY2020 due to the SBP policy of granting deferrals and restructuring/rescheduling of loans due to the COVID-19 shock.

Figure B4.10: NPLs and Provisions Against NPLs— Flows, CY2016–Q3 CY2020

(PRe bllion)

Source: SBP.
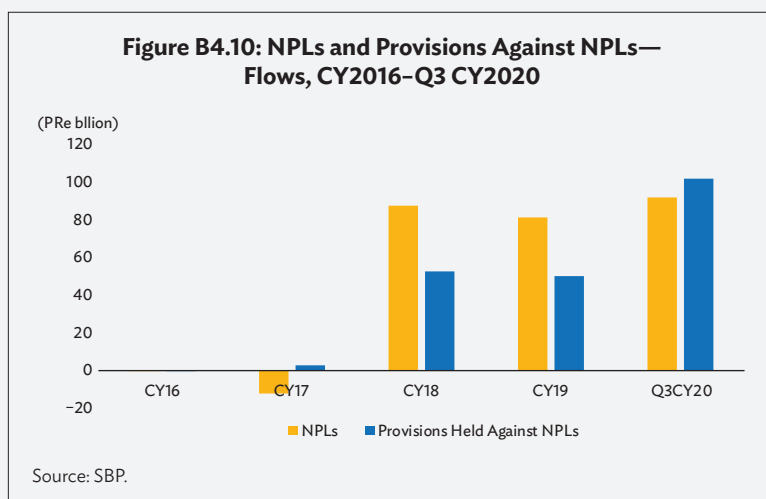
Analysis of sector-wise NPLs shows that flows to the textile sector decreased in CY2016 and CY2017; however, they increased in CY2018 due to economic uncertainty and have slightly reduced in CY2019 and CY2020 (Figure B4.11).

Comparison of segment-wise NPL flows shows that NPLs in the corporate sector increased in CY2018 and CY2019 due to uncertain economic indicators and declined in CY2020 due to the SBP's COVID-19 policy package (Figure B4.12). NPLs in the agriculture sector increased in CY2018, and after falling in CY2019 have increased yet again in CY2020 despite the SBP policy of granting deferral in principal repayment, which is a cause for concern. The consumer finance sector has also seen an increase in NPLs in CY2020 because of COVID-19, while the SME sector has seen a low level of NPLs since CY2017.

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7   A NPL is a loan in which the borrower is in default due to the fact that they have not made the scheduled payments for a period of 90 days.

Box 4.1 *continued*

Figure B4.11: Sector-wise Flow of NPLs, CY2016–Q3 CY2020

(PRe billion)   (PRe billion)

■ Agribusiness   ■ Automobile/Transportation   ■ Financial
■ Production/Transmission of Energy   ■ Sugar   ●— Textiles (right)
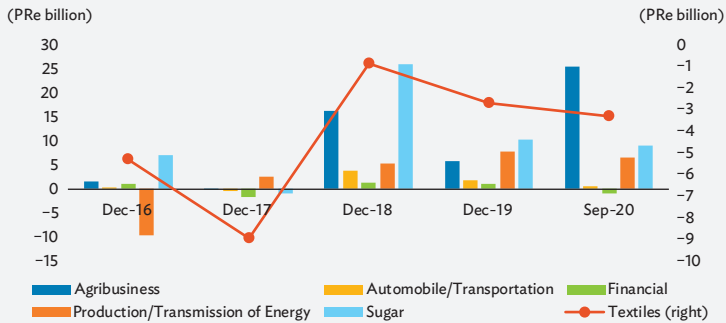
Source: SBP.

Figure B4.12: Segment-wise Flow of NPLs, CY2016–Q3 CY2020

(PRe billion)   (PRe billion)

■ SME Sector   ■ Agriculture Sector   ■ Consumer sector   ●— Corporate Sector (right)
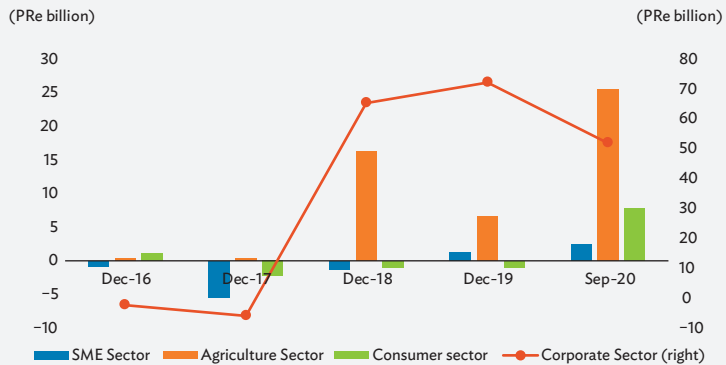
Source: SBP.

The ratio of NPLs to total loans decreased from CY2015 to CY2018 because of low interest rates and more or less stable economic growth during these 3 years, but deteriorating economic indicators from the middle of CY18 onward resulted in higher NPLs in CY2019 and CY2020 (Figure B4.13). However, the ratio of NPLs to total loans in CY2020 is still low because of SBP's aggressive COVID-19 relief package.

Box 4.1 *continued*

Figure B4.13: NPLs to Total Loans, CY2015–Q3 CY2020

(PRe billion)

NPLs (left)

Source: SBP.
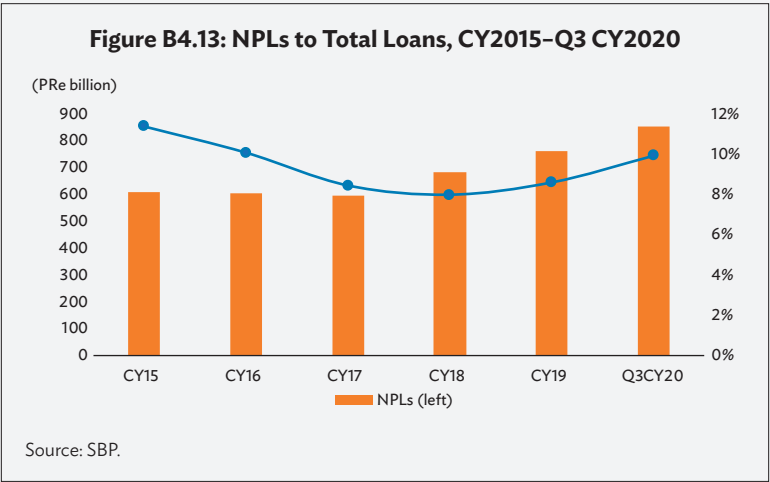
Similarly, the ratio of net NPLs to net loans has followed a similar trend and currently stands at 1.7% (Figure B4.14).

Figure B4.14: Net NPLs to Net Loans, CY2015–Q3 CY2020

(PRe billion)

Net NPLs (left)

Source: SBP.
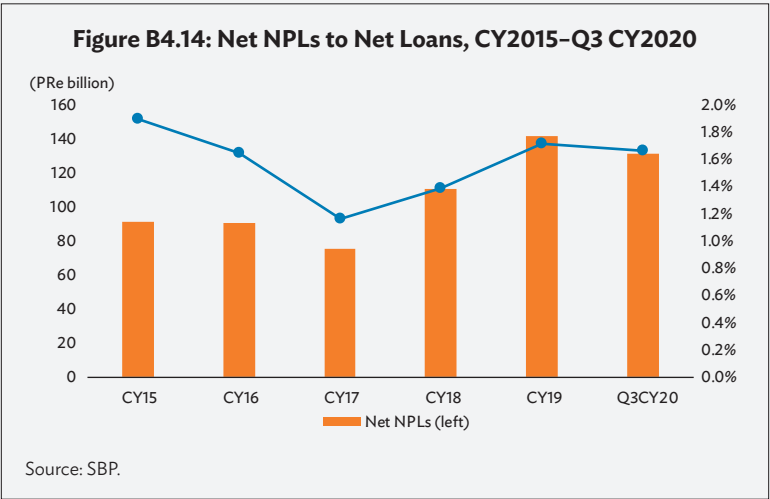
Box 4.1 *continued*

Profitability

The Return on Assets[8] (ROA) and Return on Equity[9] (ROE) profitability indicators show that banks' after-tax profit dipped from CY2015 to CY2018, while it increased in both CY2019 and first 9 months of CY2020 (Figure B4.15). The increase in CY2020 bodes well for the banking system given the bleak economic position in CY2020.

Figure B4.15: ROA, ROE, and Profit After Tax, CY2015–Q3 CY2020
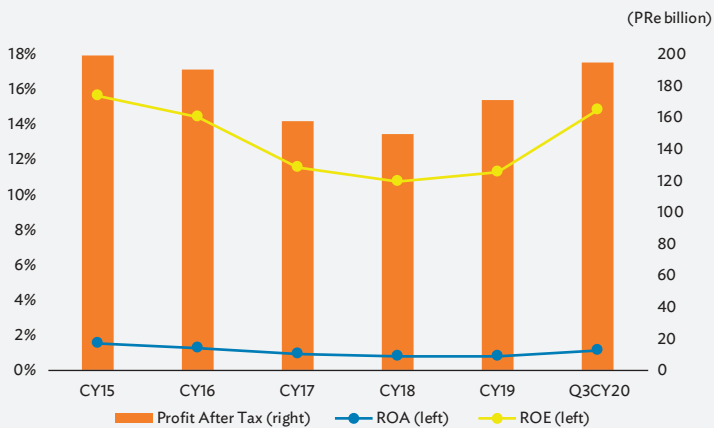
Source: SBP.

The ratio of net interest income to gross income has consistently increased from CY2015 to CY2020, showing that banks have continuously managed to increase operating profit despite uncertain economic indicators from CY2018 onward (Figure B4.16).

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[8]   The term Return on Assets (ROA) refers to a financial ratio that indicates how profitable a company is in relation to its total assets.

[9]   Return on equity (ROE) is the measure of a company's net income divided by its shareholders' equity.

Box 4.1 *continued*

Figure B4.16: Net Interest Income to Gross Income, CY2015–Q3 CY2020

(PRe billion)

Source: SBP.
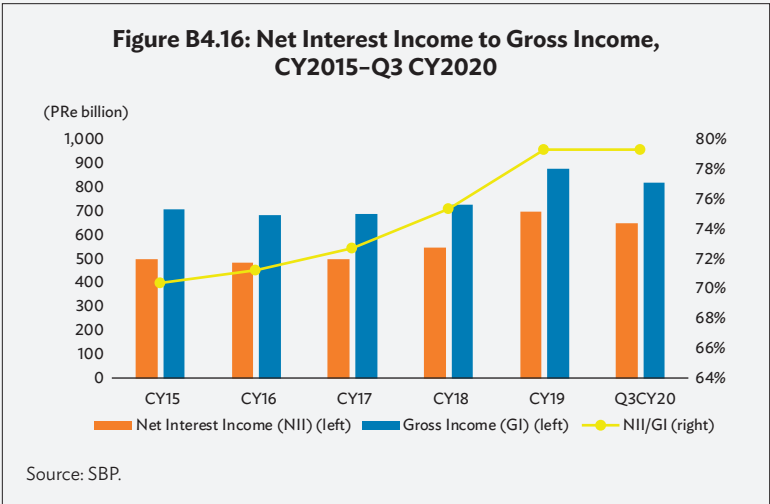
Overall Performance

The overall performance of the banking system has been very encouraging given the difficult economic situation due to COVID-19. As soon as the lockdowns began, commercial banks under SBP regulatory relief started shoring up their CAR by reducing risky assets and loans. Banks increased their net investments in government securities and were cautious in extending loans to low-quality borrowers. Although advances to the private sector declined because of virtual lockdowns in many sectors, SBP schemes still kept the flow of credit moving in the economy. Due to the cautious approach of banks and regulatory relief and SBP guidance, NPLs have not grown. Bank profitability has been very high during the period because of increased investment in government bonds and also high uptake by consumers of digital and online payments. Overall, the banking system has played a leading role in providing financial support to various sectors of the economy in this critical time.

Source: This box was prepared by Muhammad Moaiz Siddiqui, Deputy Director, Systemic Risk Monitoring Division, Financial Stability Department, State Bank of Pakistan.

CAREC countries, particularly the oil importers, already had a fragile economic outlook. The COVID-19 pandemic has caused a further downturn in economic activity. The turmoil in the financial markets has sharply increased public debt in the region. The history of debt waves suggests that a broad based and rapid increase in debt has occurred in the CAREC region. Since 2010, the total debt has climbed to 60% of gross domestic product (GDP). COVID-19 has further amplified debt accumulation in the CAREC region. The unprecedented scale of fiscal stimulus has increased the fiscal cost and fiscal deficits, which are expected to increase by approximately 5 percentage points of GDP. The COVID-19 crisis may tip some of the CAREC countries into widespread debt distress.

Debt management is the priority policy choice for the CAREC countries to maintain their fiscal health. Nonetheless, the magnitude of external and internal shocks depends on domestic fiscal policy frameworks and choices. To overcome the COVID-19 and fiscal crises, CAREC countries must have good debt management and debt transparency mechanisms. Reinforcement of monetary, exchange rate, and fiscal policy frameworks can safeguard CAREC countries' debt sustainability.

International organizations (the World Bank and International Monetary Fund) have regularly published reports on developing countries' debt sustainability. The analysis in these reports shows the borrowing decisions of low-income countries in a way that balances their financing needs with their ability to repay. The debt sustainability analysis for the CAREC region suggests that the overall risk of debt distress for Pakistan, Afghanistan, and Tajikistan is high, whereas the Kyrgyz Republic's overall risk of debt distress is moderate, and that of Uzbekistan is low, according to the latest information.

Overall, the debt sustainability issue is prevailing in the largest economies and oil importing countries in the CAREC region (see Figure 4.1 and Table 4.1).

Figure 4.1: Debt-to-GDP in CAREC Countries

GDP = gross domestic product.

Note: The horizontal line indicates the fiscal responsibility debt limit (FRDL). It shows the sustainable debt limit.

Source: IMF (2020c).
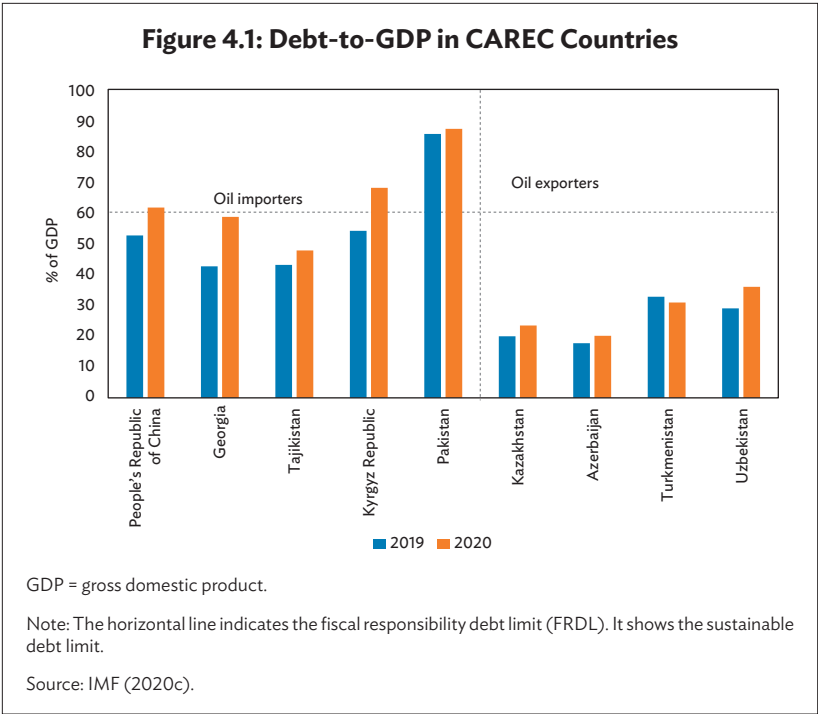
Table 4.1: Debt Accumulation in the CAREC Region: National Debt ($ billion)

Country	2019	2020
Oil Importers		
Afghanistan	1.25	1.44
People's Republic of China	7,518.36	8,874.42
Georgia	7.53	8.46
Kazakhstan	35.06	38.22
Kyrgyz Republic	4.72	5.07
Mongolia	29.70	31.20
Pakistan	190.71	225.67
Oil Exporters		
Tajikistan	3.64	4.03
Azerbaijan	9.32	8.98
Turkmenistan	14.14	16.02
Uzbekistan	12.84	16.75

Source: World Bank, World Development Indicators.

The unsustainability of the debt has implications not only within the large CAREC countries; it has also affected intercountry economic dealings. The pandemic has affected debt indicators in nearly all of the CAREC countries. In contrast to existing reports on individual countries, this chapter aims analyze the debt sustainability of the whole region by considering the individual country growth dynamics. In the wake of the pandemic as debt is growing in CAREC countries, this chapter comprehensively reviews the implications and projections for all CAREC countries.

The World Bank and International Monetary Fund (IMF) debt sustainability reports are based on individual country analysis. However, this chapter provides an overall regional perspective. Regional interconnectedness plays an important part in recovery policy, so this chapter's approach is an overall regional assessment rather than an individual perspective. Timely pandemic debt assessment and projections are the value proposition of this chapter.

This chapter first reviews the history of broad based debt accumulation and the impact of the COVID-19 pandemic on debt accumulation. Next, the chapter makes scenario-based debt projections for the post-COVID-19 era and discusses the broad role of fiscal and monetary policy that can help debt sustainability. Based on this analysis, the chapter will provide pragmatic recommendations about debt sustainability in the CAREC region.

4.2 Debt Accumulation in CAREC Countries

Before the current crisis, several CAREC countries had already experienced waves of debt accumulation. The first debt wave happened during 1990–2001. The Washington Consensus led Central and East Asian countries to liberalize their economic policies during the 1990s. Financial market liberalization raised the investment sentiments and resulted in businesses borrowing heavily from banks. To resolve the private debt, large banks and corporations needed bailouts from the World Bank and the IMF.

A second debt wave happened due to the global financial crisis that disrupted bank financing during 2007–2009. It pushed Pakistan, Georgia, Kazakhstan, and Mongolia into recessions, with GDP growth at zero or dipping into the negative. Resulting bank bailouts and international assistance increased the debt-to-GDP ratio in these countries.

These two waves of debt shared several important economic factors. The debt surged amid low real interest rates and drastic changes in financial markets with the focus of loan expansions in the economy. The debt waves ended with financial crises and coincided with global

recessions (1991, 1998, 2009). These crises were intensified by several shocks that sharply increased investors' risk aversion and borrowing costs, and the sudden halt to capital inflows dampened economic activity. However, economic instability controlling reform agendas further stirred up the financial crises. For instance, many emerging economies introduced inflation targeting, greater exchange rate flexibility, fiscal rules, or more robust financial sector supervision following the financial crises.

Similar to other regions, the CAREC region is experiencing widespread and severe financial stress due to the outbreak of COVID-19. The financial stress in these economies is further aggravated by other weaknesses, such as rising fiscal and current account deficits and costly borrowing. Since management of the health crisis requires huge financial resources regardless of the fiscal cost and fiscal situation, fiscal deficits in these economies are likely to increase by about 5% of GDP in the year 2020 (IMF 2020b).

Table 4.2: Current Account Balance
(% of gross domestic product)

		2016	2017	2018	2019	2020
Oil Exporters	Azerbaijan	−3.6	4.1	12.9	13.9	11.6
	Kazakhstan	−6.5	−3.3	0	−1	−1.4
	Turkmenistan	−19.9	−11.5	−8.2	−2.3	−3.2
	Uzbekistan	0.4	2.5	−7.1	−7	−6.5
Oil Importers	Afghanistan	7.6	3.4	6.9	1.2	0.7
	Georgia	−13.1	−8.8	−7.7	−7.3	−7.1
	Kyrgyz Republic	−11.6	−6.5	−10	−12	−12
	Pakistan	−1.7	−4.1	−6.3	−4.8	−2.8
	Tajikistan	−4.2	2.2	−5	−4.5	−4.3

Source: Asian Development Bank (2020).

Investors may be resilient toward uncertain fiscal positions if countries are able to bring viable institutions and channels to restore fiscal sustainability once recovery gets underway.

The past waves of debt have shown that the anchoring role of monetary and fiscal policy is critical in achieving sustainable debt levels. Although global and external recessions triggered the financial crises,

in developing countries like CAREC countries, the adverse impact on individual economies was made stronger by domestic policy choices.

Countries are mismanaging their financing of expenditures. They require good debt management strategies and debt transparency to ensure debt payments and reduce borrowing costs. Fiscal and monetary policy coordination is important for fiscal financing and for encouraging investor confidence in the CAREC region.

Table 4.3: Historical Average of Fiscal Indicators in CAREC Countries

	Revenue-to-GDP Ratio (%)	Primary Balance	Fiscal Balance
Pakistan	14.3	–2.0	–6.5
People's Republic of China	27.3	–2.6	–2.3
Tajikistan	27.2	–2.3	–3.0
Georgia	...	...	–2.8
Uzbekistan	27.9	1.5	1.6
Azerbaijan	38.9	3.3	3.0
Kyrgyz Republic	33.5	–3.0	–3.9
Kazakhstan	21.7	–0.2	0.0

GDP = gross domestic product.
Source: International Financial Statistics (2020).

Table 4.3 demonstrates that the role of fiscal policy is weak. Over the last decade, Pakistan, the PRC, Tajikistan, and the Kyrgyz Republic had negative values for both average historical primary balance and overall fiscal balance. To manage the fiscal imbalance, governments massively stockpiled debt, which led to impacts on financial markets.

A high fiscal deficit affects resource allocation among the private and the public sectors. In Pakistan, the borrowing of the government from banks constitutes more than 90% of total loans. This reduces the resources for the private sector and creates a barrier for private sector development. CAREC economies are also spending on low-return public sector projects and unjustified subsidies such as those on food, fertilizers, and the petroleum sector. This requires a large share of state expenditures and gives rise to fiscal deficits.

Further, when interest rates are raised, a high fiscal deficit can increase debt service payments. This situation leads to distortions in the

Figure 4.2: Unemployment Rate in CAREC Countries, 2019 (%)

Source: World Bank, World Development Indicators.
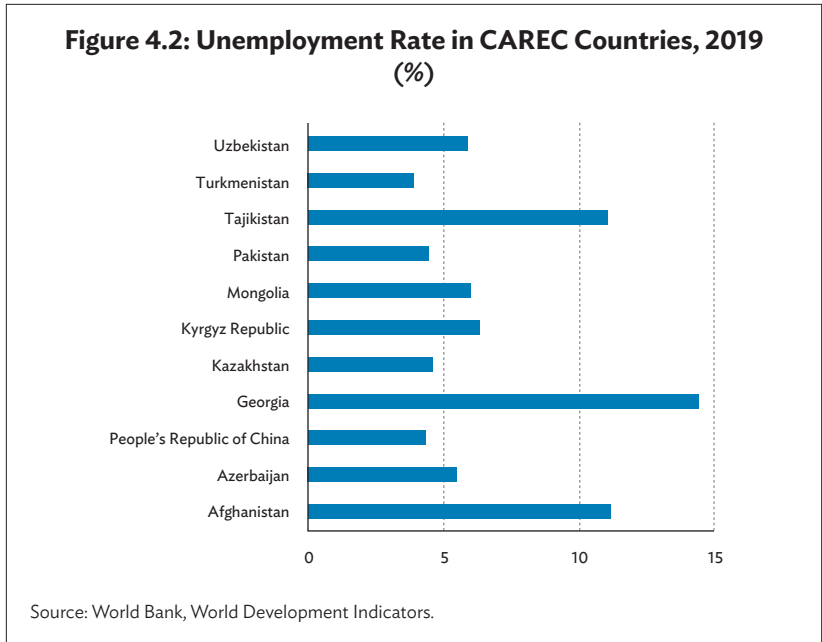
distribution of income. The increase in debt service charges diminishes public investment and reduces private investment, resulting in lower potential economic growth and high rates of unemployment in CAREC countries (Figure 4.2). In 2019, higher unemployment rates were found in high-debt countries such as Georgia (14%), Afghanistan (11%), and Tajikistan (11%); Pakistan had 7% unemployment. The low-debt CAREC countries had lower unemployment rates, roughly 4%.

4.2.1 Debt Service on External Debt

Figure 4.3 shows the debt service on the external debt of CAREC member countries. It shows that the PRC has the highest debt service on external debt, in fact, the PRC's debt service made up 68% of the total CAREC debt service in 2019, when the PRC had a debt service of nearly $280 billion. The PRC's debt service started rising in 2013, when it was about $70 billion. The Kyrgyz Republic has the second highest debt service after the PRC, of approximately $40 billion in 2020, which is 17% of the CAREC region's total. Pakistan has the third highest debt service, that is, $15 billion or nearly 7% of the total for the CAREC region in 2020. All other countries except Mongolia had debt service of less than $5 billion in 2020.

Figure 4.3: Debt Service on External Debt (time series)
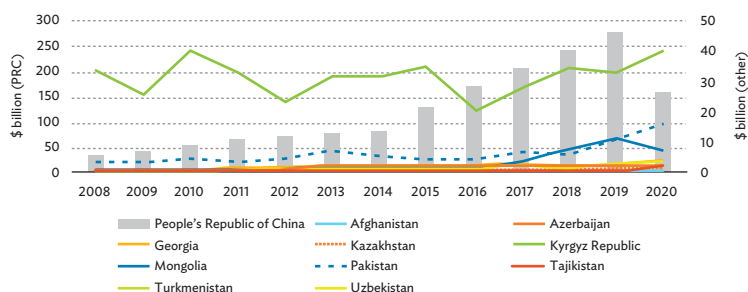
PRC = People's Republic of China.

Source: World Bank, World Development Indicators.

4.2.2 Interest Payment on External Debt

Figure 4.4 shows that the PRC is paying the highest interest on external debt ($95 billion in 2019); its interest payment has increased by $59 billion since 2016. The Kyrgyz Republic and Pakistan are paying the

Figure 4.4: Interest Payment on External Debt
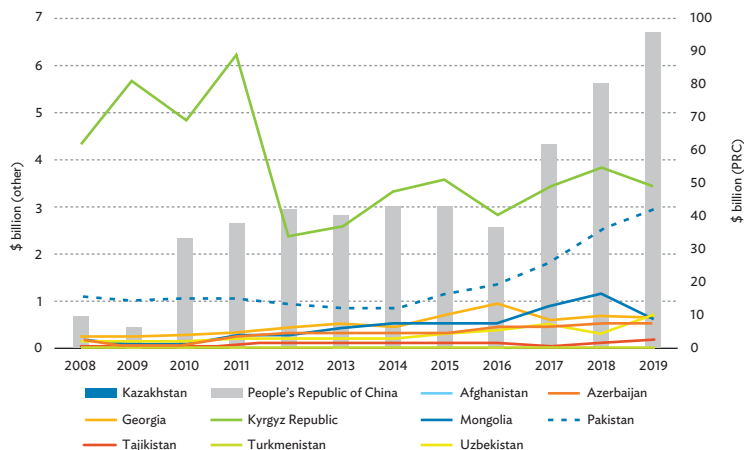
PRC = People's Republic of China.

Source: World Bank, World Development Indicators.

highest after the PRC. They paid $3.4 and $2.9 billion, respectively, in 2019. The rest of the CAREC countries' interest payments were less than $1 billion for 2019.

4.2.3 Ratio of Debt Service to Gross Domestic Product

Figure 4.5 shows that the Kyrgyz Republic has the highest debt-to-GDP ratio in the CAREC region; in 2019, the Kyrgyz Republic's ratio was 4.54, down from a 2010 high of 8.23. The ratios for all other CAREC countries were below 1.0 during the same time frame.

Figure 4.5: Ratio of Debt Service to Gross Domestic Product

GDP = gross domestic product.

Source: World Bank, World Development Indicators.
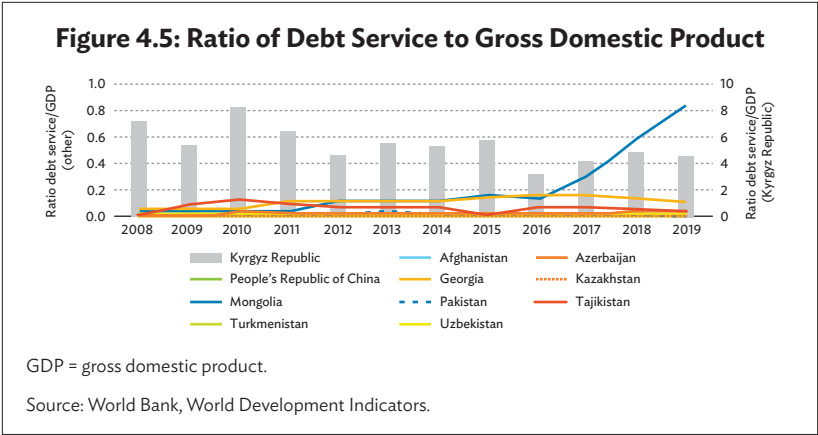
4.2.4 Debt Service as a Percent of Exports

Figure 4.6 shows that looking at debt service as a percent of exports for countries in the CAREC region, Mongolia had the highest percentage by far in 2019 at 133.09%, followed by Kazakhstan (48.11%). Pakistan's percentage jumped from 19.14% in 2018 to 35.35% in 2019. Georgia has had a declining trend of debt service since 2016 when it was 36.75% of exports; it fell to 21.64% by 2019. All other CAREC countries had debt service of less than 20% of exports in 2019.

Figure 4.6: Debt Service as a Percentage of Exports
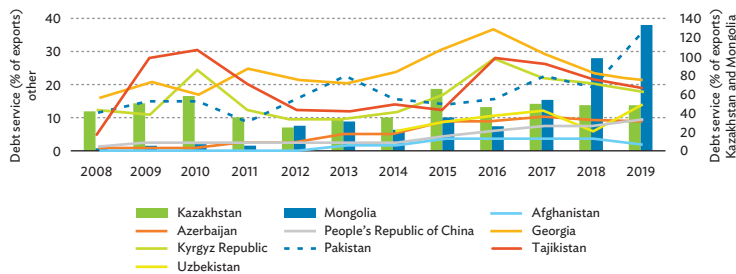
Source: World Bank, World Development Indicators.

4.2.5 Debt Service as a Percent of Reserves

Figure 4.7 shows CAREC countries' total reserves as a percentage of total external debt. It shows that Afghanistan and the PRC had total reserves of 320% and 153% of external debt in 2019, respectively. The percentage for Uzbekistan was 134%, the third highest. All other countries had total reserves of less than 50% of external debt.

Figure 4.7: Total Reserves as a Percentage of Total Debt
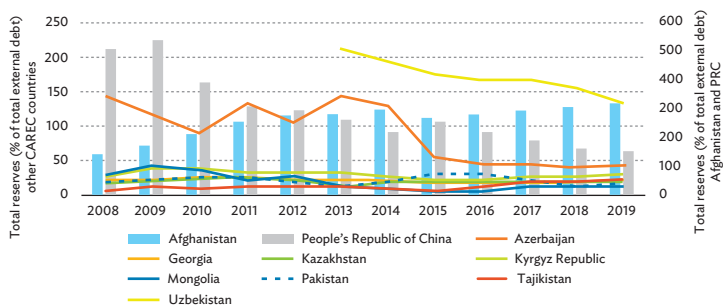
CAREC = Central Asia Regional Economic Cooperation, PRC = People's Republic of China.

Source: World Bank, World Development Indicators.

4.3 Reasons for CAREC Countries' Debt

4.3.1 Current Account Balance

Figure 4.8 shows the current account balances for CAREC member countries. Except for the PRC and Azerbaijan, all CAREC countries show current account deficits. The PRC has the highest current account balance across all CAREC member countries; in 2008 it was $420 billion and in 2018 it was nearly $50 billion, which was the lowest surplus for the PRC in the time frame included in the figure. Similarly, Azerbaijan also shows a surplus balance; in 2008 it was around $16 billion. After 2011 it started to decline and turned to a deficit in 2015–2016, but it returned to a surplus after that and reached $6 billion in 2018. The empirical study of Nickel and Vansteenkiste (2008) suggests that countries with debt-to-GDP ratios up to 90% experience a direct relationship between the higher fiscal deficit and a higher current account deficit. The direct relationship between the fiscal deficit and current account balance leads to high debt. Among the CAREC countries, Pakistan is one of the members that experienced a current account deficit leading to IMF loan programs in the recent past. The debt-to-GDP ratio of Pakistan has increased from 67% to 86% between 2017 and 2019.

Figure 4.8: Current Account Balance

PRC = People's Republic of China.

Source: World Bank, World Development Indicators 2019.
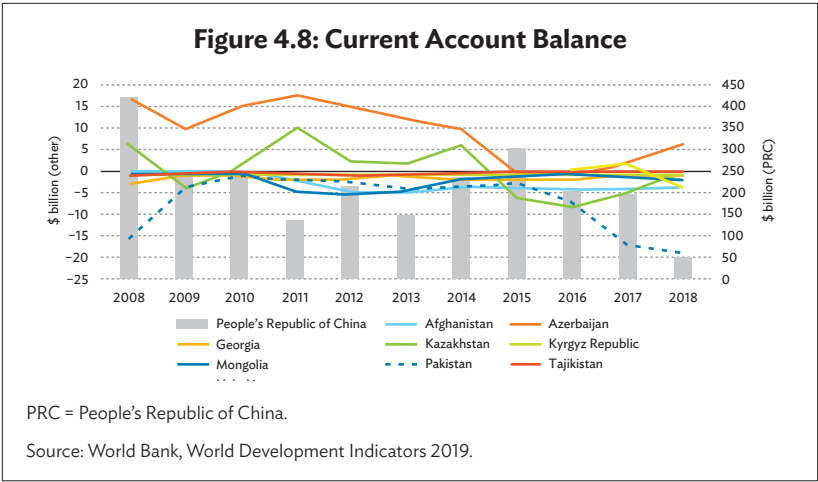
4.3.2 Exchange Rate

Schonerwald da Silva and Vernengo (2007) observed two mechanisms through which exchange rates influence public debt. Exchange rate devaluation implies higher payment, and public debt increase leads to a perception of higher default risk, which forces capital outflows and a devaluation of the exchange rate. The exchange rate frequently varies across the CAREC member countries; Figure 4.9 shows that Azerbaijan and Georgia had the lowest exchange rates of AZN1.70 and GEL2.53 against the US dollar, respectively, for the year 2018, whereas Mongolia had the highest exchange rate in the CAREC region (see Figure A4.3). The Kyrgyz Republic's and Afghanistan's exchange rates show slight growth according to the graph, while Kazakhstan's exchange rate reflects a more notable increase in 2015–2016, with the exchange rate in 2018 reaching T344 to the dollar.

Figure 4.9: Official Exchange Rate

LCU = local currency unit.

Source: World Bank, World Development Indicators 2019.
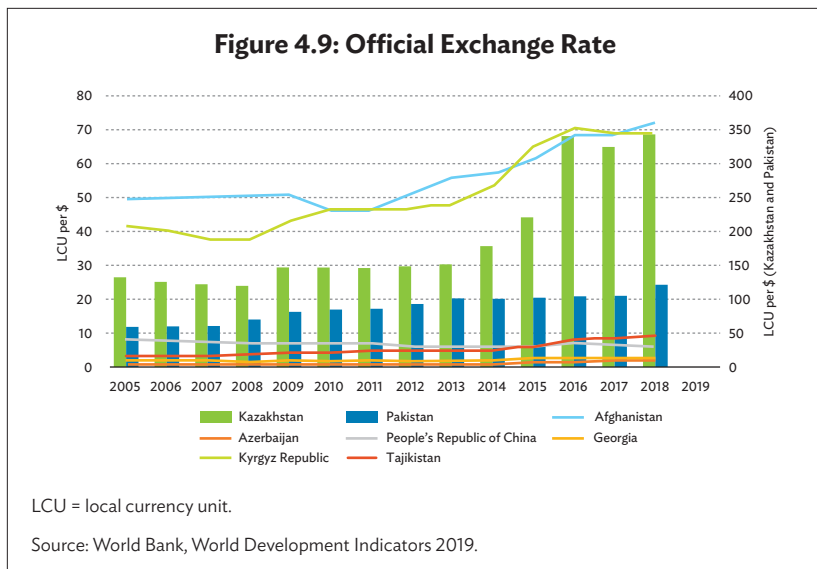
4.3.3 Grants

Figure 4.10 shows that all CAREC member countries receive grants for various purposes, with Afghanistan and Pakistan as the countries receiving the most grant money in the region. From 2009 to 2012, Afghanistan received more than $5,000 million annually in grants to

cater to various issues whereas Pakistan's yearly grant money intake peaked just under $3,000 million in 2011. Turkmenistan received the least money in grants ($14.47 million) among the CAREC countries in 2018, followed by Azerbaijan and Uzbekistan.

Figure 4.10: Grants

Source: World Bank, World Development Indicators 2019.
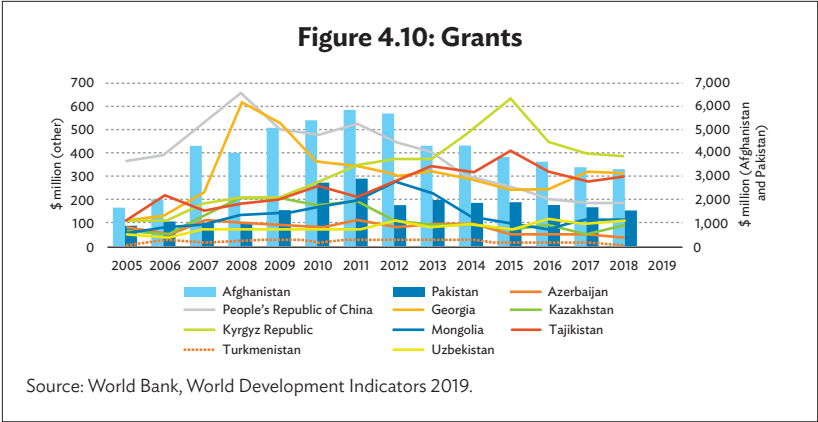
4.3.4 Foreign Direct Investment (Inflow)

Cross-border transactions related to direct investment are known as foreign direct investment (FDI). The FDI flows for CAREC show that the PRC has the largest inflows among the CAREC member countries; the PRC's largest year for FDI stood at $300 billion in 2013. Kazakhstan attracted the second most FDI in the region, with its highest FDI inflow ($17.2 billion) recorded in 2016. Kazakhstan's FDI inflows dropped heavily to $2.14 billion in 2018. The Kyrgyz Republic and Kazakhstan remain the countries with the lowest FDI inflows. The study of Djulius (2018) compared FDI and foreign loan and domestic saving in both the short- and long-term economic growth of Indonesia. The estimated findings suggest a positive and significant effect on economic growth.

4.4 Consequences of CAREC Countries' Debt

4.4.1 Debt-Economic Growth Nexus

Although debt is used for expenditures that will eventually generate productivity and stimulate the economy, literature on public debt such as Reinhart and Rogoff (2010) and Panizza and Presbitero (2012)

suggests that after a certain threshold, public debt will result in adverse impacts on economic growth.

The relationship between debt and economic growth is an important issue in low-income and developing countries. Researchers have investigated three types of evidence across the countries: positive, negative, and insignificant effects of public debt on economic growth. Many research studies support the view that public debt has a negative association with economic growth. Brida, Gómez, and Seijas (2017), Reinhart and Rogoff (2010), Ahlborn and Schweickert (2016), and many others have established this relationship.

In contrast, the studies of Burhanudin et al. (2017) and Gómez-Puig and Sosvilla-Rivero (2017) suggest a strong positive nexus that debt increases economic growth in the short term. In addition, Perlo-Freeman and Webber (2009) provide an explanation of this nexus from the perspective of macroeconomic theory. They suggest that government debt to fund expenditures should have a positive impact on economic growth if the expenditures are used on productive sectors such as health care, education, and nutrition. Kempa and Khan (2017) and Arčabić et al. (2018) argue that lower-income countries have not made a reasonable attempt at increasing taxes as a substitute for debt. Rather than increasing debt or taxes, they suggest that creating an investment-friendly economic environment is important.

4.4.2 Gross Domestic Product

Figure 4.11 shows the GDP of CAREC countries. In terms of absolute value in 2019, the PRC had the highest GDP at nearly $12,000 billion and

Figure 4.11: Gross Domestic Product

PRC = People's Republic of China.

Source: World Bank, World Development Indicators 2019.
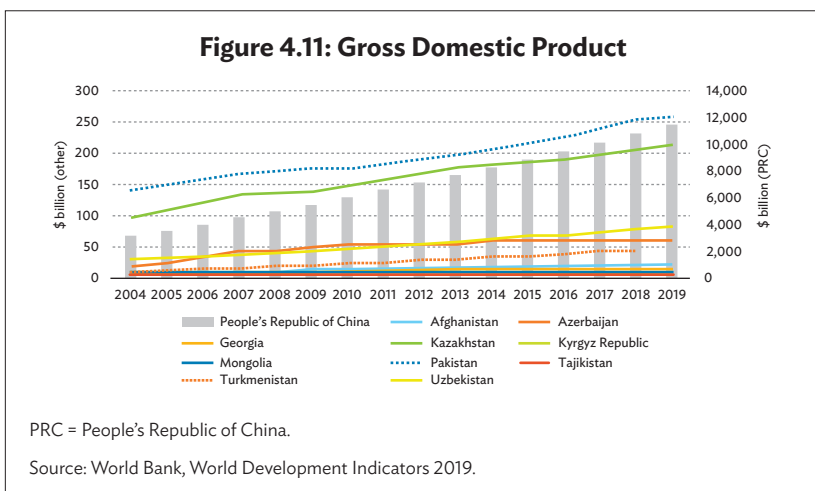
Tajikistan had the lowest value among the CAREC countries. However, Kazakhstan had the highest GDP per capita, nearly $12,000 in 2019. Kazakhstan is followed by the PRC and then by Azerbaijan, which has a GDP per capita of more than $5,500. Afghanistan, Tajikistan, and Pakistan show the lowest GDP per capita trends in the CAREC region.

4.4.3 Gross Domestic Product Growth

Figure 4.12 shows that Tajikistan's GDP grew by 7.01% in 2019. It has the highest GDP growth rate from 2016 to onward (see Figure A4.2). Also in 2019, Tajikistan was followed by Turkmenistan and the PRC having GDP growth rates of 6.29% and 6.11%, respectively. Uzbekistan, Georgia, Kazakhstan, the Kyrgyz Republic, and Mongolia have growth rates of more than 4% whereas Pakistan has the lowest growth rate; it fell from 5.83% in 2018 to 0.98% in 2019.

Figure 4.12: Gross Domestic Product Growth, 2019 (%)

Source: World Bank, World Development Indicators 2020.
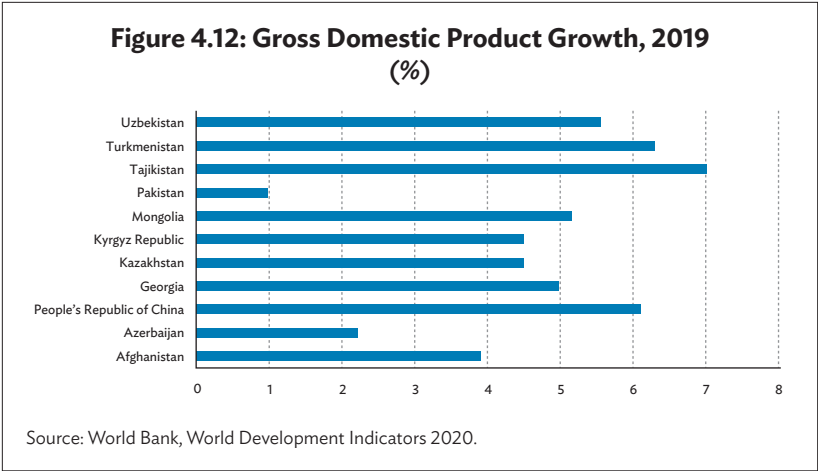
4.4.4 Unemployment

Figure 4.13 shows the unemployment rates in CAREC countries in 2019. The highest rate was recorded for Georgia at 14.39%, followed by Afghanistan (11.11%) and Tajikistan (11.02%). The lowest rate was recorded for Turkmenistan (3.91%). Pakistan's unemployment rate has increased by 2.63 points from 1.82% in 2014 to 4.45% in 2019. Over decade ago, in 2008, Pakistan had the lowest unemployment (4.3%).

Figure 4.13: Unemployment Rate, 2019
(%)

Country	
Uzbekistan	
Turkmenistan	
Tajikistan	
Pakistan	
Mongolia	
Kyrgyz Republic	
Kazakhstan	
Georgia	
People's Republic of China	
Azerbaijan	
Afghanistan	
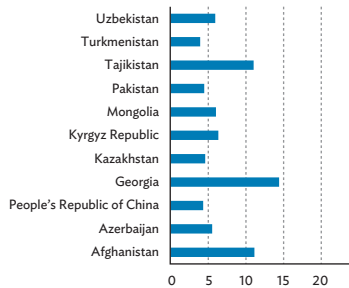
Source: World Bank, World Development Indicators 2020.

4.4.5 Inflation

Figure 4.14 shows the inflation rates of CAREC member countries over time. The latest outlook suggests that inflation is on the higher side in all oil importing countries. For example, in 2019, Pakistan's inflation

Figure 4.14: Inflation Rate

Change in consumer price (%)

Legend: Afghanistan, Azerbaijan, People's Republic of China, Georgia, Kyrgyz Republic, Mongolia, Pakistan, Tajikistan
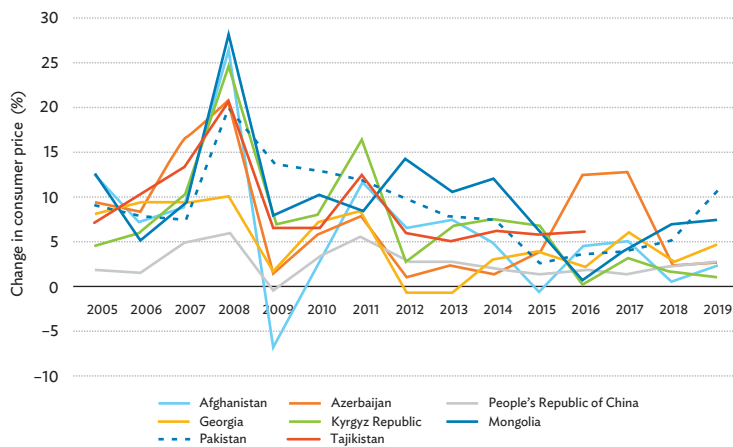
Source: World Bank (2020).

rate was 10.6%, followed by Mongolia at 7.3%, while four countries in the CAREC region had inflation rates of less than 3.0%: Afghanistan, Azerbaijan, the PRC, and the Kyrgyz Republic. The inflationary pressure is one of consequences of the increase in debt. This pressure pushes governments to change the monetary policy, which can further amplify the debt.

4.5 Debt Sustainability Analysis

As discussed earlier, as a result of COVID-19, the debt-to-GDP ratio significantly increased in 2020 particularly in oil-importing CAREC countries (Figure 4.1). This trend raises the importance of debt sustainability in the region. For that purpose, one has to understand how the debt-to-GDP ratio would be in the sustainable range, the fiscal responsibility debt limit (FRDL) of a 60% debt-to-GDP ratio.

Policymakers must consider the interest rate-growth differential. This differential is essential to predict long-run fiscal sustainability. A higher interest rate raises debt servicing, and that changes the debt dynamics entirely. Whereas achieving higher growth means a lower debt-to-GDP ratio, the low interest rate suggests a low cost of borrowing for higher economic growth. Maintaining this differential would reduce the debt burden even in high-debt countries. In this framework, debt sustainability is a real concern in low-income countries, particularly in oil-importing ones where economic growth is low and interest rates are very high.

Based on the historical growth context and choice of policy, this analysis specifies several scenarios to evaluate the case of CAREC countries. In particular, we carefully discuss the threshold levels of economic growth and interest rates. Similar to the IMF's debt sustainability analysis (DSA), we employ a debt sustainability framework to evaluate the role of the interest rate-growth differential and debt sustainability. We use this framework to make projections with different historical movements of the key indicators. In contrast to the IMF's DSA framework for debt sustainability analysis, this chapter assesses the debt of the whole CAREC region and provides fresh evidence in the post-COVID-19 era.

In equation (1), r notes the interest rate, and g" is the growth rate of real GDP.

$$d_t = \frac{(l + r)}{(l + g)} * d_{t-1} + pb_t, \tag{1}$$

where

        d = debt-to-GDP ratio,
        r = real interest rate,
        g = growth rate of real GDP,
        pb = primary balance as a percentage of GDP,
        t = time subscript.

In equation (1), the increase in growth (g) alone cannot offset additional debt when a country must pay interest payments along with new debt. The increase in the debt-to-GDP ratio pushes the government to pay the interest payment bill either through its own revenues or through accumulating new debt. In that situation, if at least part of the interest payment is made through the country's own revenues, then the country will experience a surplus in the primary balance, which reduces the debt ratio ($pb < 0$). If instead, newly borrowed debt in the period exceeds the interest payment, it leads to a primary deficit ($pb > 0$), which further adds to the debt. The next section provides the results based on this debt sustainability framework.

4.5.1 Pakistan

Addressing the financial constraints during COVID-19, CAREC countries have required fiscal resources at a larger scale. As discussed in previous sections, governments provided fiscal packages to individuals and businesses to combat the economic shocks caused by COVID-19. Pakistan has accumulated more than $10 billion in new debt during the pandemic.

Pakistan's debt-to-GDP ratio was the highest in the region at 86% in 2019 and further increased to 88% in 2020 (Figure 4.15). In the baseline scenario we assume: (i) the primary balance is close to zero and (ii) the historical real interest rate is 2.7%. Using these assumptions, we project the debt-to-GDP ratio until 2030. The ratio decreases from 86% to 64% in 2030 if the government smoothly maintains the primary balance at a level close to zero. A sustainable debt level will be achieved if GDP growth is higher than 4.5% annually (see Figure 4.16) and the real interest rate does not cross the historical real interest rate value.

Figure 4.15: Pakistan: Post-COVID-19 Growth and Debt Sustainability Projections

Optimistic Scenario

Pessimistic Scenario

ir = gr   ir < gr = 0.05   ir < gr = 0.10

ir > gr = 0.05   ir = gr   ir < gr = 0.10
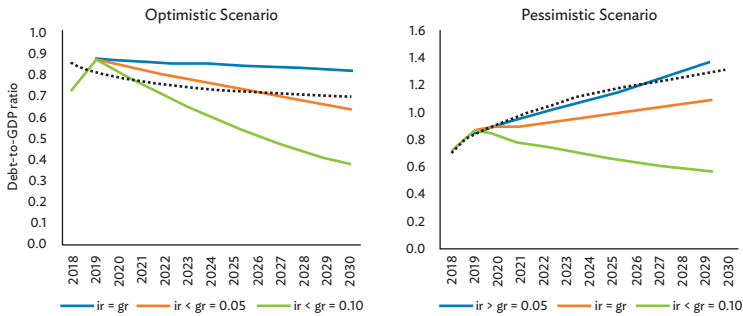
GDP = gross domestic product.

Source: World Bank (2020).

Figure 4.16: Historical Growth Rate in CAREC Countries (%)

Country	Value
Uzbekistan	6.8
Turkmenistan	8.5
Tajikistan	6.7
Pakistan	3.6
Mongolia	6.9
Kyrgyz Republic	4.0
Kazakhstan	4.2
Georgia	4.1
People's Republic of China	7.8
Azerbaijan	2.3
Afghanistan	6.3

Source: World Bank (2020).

The pessimistic scenario assumes: (i) the historical primary balance is –3.5% of GDP and (ii) the historical real interest rate is 2.7%. The debt-to-GDP ratio will increase in the case of a negative primary balance. With a historical real interest rate of 2.7%, 10% GDP growth is required to manage the current level of the debt-to-GDP ratio. The FRDL of 60% will be achieved in 2030 with a 10% GDP growth.

4.5.2 People's Republic of China

Government debt in the PRC has been close to 50% of GDP in the recent past. It surpassed 61% of GDP during the pandemic. The debt-to-GDP ratio has increased despite the concern over the national debt statistics that they do not include the government liabilities.

Figure 4.17 provides the debt prediction for the PRC. These results are based on assumptions of monetary and fiscal policy and economic growth for alternative scenarios. Also, the prediction includes sensitivity analysis with respect to policy and economic assumptions. Our baseline projection in Figure 4.17 shows the debt ratio falling till 2030 based on assumptions that the primary balance will be less than 0.14% of GDP, the interest rate will not exceed the current interest rate, and the interest rate–growth differential (IRGD) will average about –9 percentage points. It will reduce the debt-to-GDP ratio from 61% to 48% by 2030, meaning that debt will have fallen by 13 percentage points of GDP.

Figure 4.17: People's Republic of China: Post-COVID-19 Growth and Debt Sustainability Projections

GDP = gross domestic product.

Source: World Bank (2020).
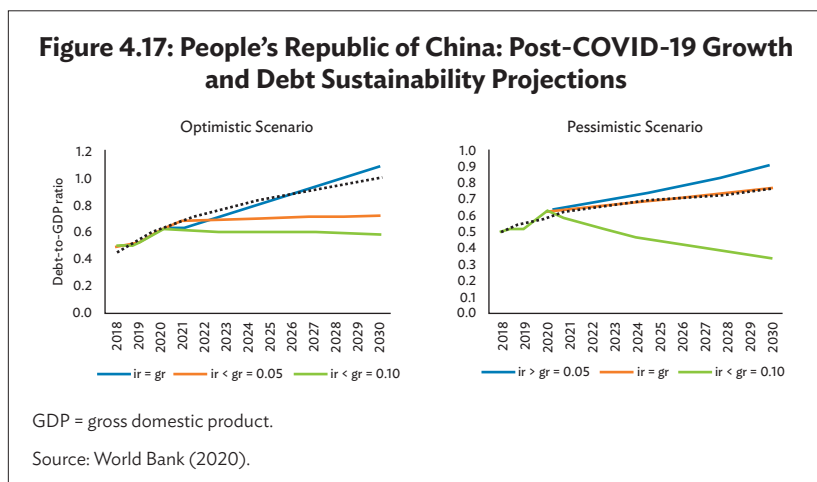
Our pessimistic projection in Figure 4.17 shows that the debt ratio will be increasing, though falling till 2030, based on the assumptions that the primary balance will be less than 0.5% of GDP and the interest rate exceeds the GDP growth rate. The interest rate–growth differential (IRGD) will be 9 percentage points on average. It will reduce the debt-to-GDP ratio from 62% to 34% by 2030. Therefore, by the year 2030, debt will have fallen by 28 percentage points of GDP.

4.5.3 Kyrgyz Republic

Government debt in the Kyrgyz Republic has been roughly 68% of GDP in the recent past. It was 54% in 2019 and increased to 68% of GDP in 2020. The debt-to-GDP ratio has increased mainly because of the adverse effects of the COVID-19 pandemic. Figure 4.18 shows the optimistic and pessimistic scenarios. In the baseline scenario we assume: (i) the primary balance is close to zero (ii) the historical real interest rate is 9%. Using these assumptions, we project the debt-to-GDP ratio until 2030. The debt-to-GDP ratio will decrease from 68% to a sustainable 60% in 2030 if the government smoothly maintains the primary balance at a level close to zero. A sustainable debt level will only be achieved with double-digit GDP growth higher than 9% annually and with the real interest rate not exceeding the historical real interest rate value.

Figure 4.18: Kyrgyz Republic: Post-COVID-19 Growth and Debt Sustainability Projections

GDP = gross domestic product.

Source: World Bank (2020).
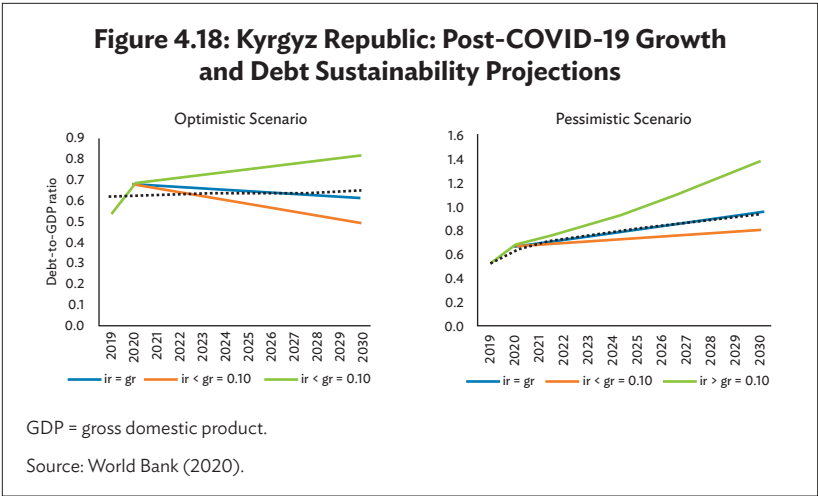
Figure 4.18 shows the debt ratio falling through 2030 based on the assumptions that the primary balance will be 1.9% of GDP and the interest rate will not exceed GDP growth rate. The interest rate–growth differential (IRGD) will average about –9 percentage points. It will improve the debt-to-GDP ratio from 68% to 50% by 2030. Therefore, by the year 2030, debt will have fallen by 18 percentage points of GDP.

The pessimistic scenario assumes that: (i) the historical primary balance is –1.9% of GDP and (ii) the historical real interest rate is 9%. The debt-to-GDP ratio will increase in the case of a negative primary balance. With a historical real interest rate of 1.9%, 13% GDP growth is required to maintain the sustainable debt-to-GDP ratio. The FRDL of 60% will be achieved in 2030 with a 13% GDP growth.

4.5.4 Azerbaijan

Azerbaijan's government debt has grown substantially, reaching $37 billion in 2014, which is 49% of GDP. The revenue earned through state oil fund transfers to the national budget had provided budgetary support. However, fluctuations in oil prices resulted in the fall of oil revenues, followed by budgetary transfers that led to the rise in government borrowing in Azerbaijan.

The debt-to-GDP ratio jumped from 11% in 2014 to 22% in 2019 and increased further in 2020 because of the pandemic. Although Azerbaijan's revenues are extremely concentrated in oil earnings, compared to other CAREC countries, debt sustainability is not the central macroeconomic issue. Even so, we have projected the future debt patterns in Azerbaijan in Figure 4.19 using different scenarios.
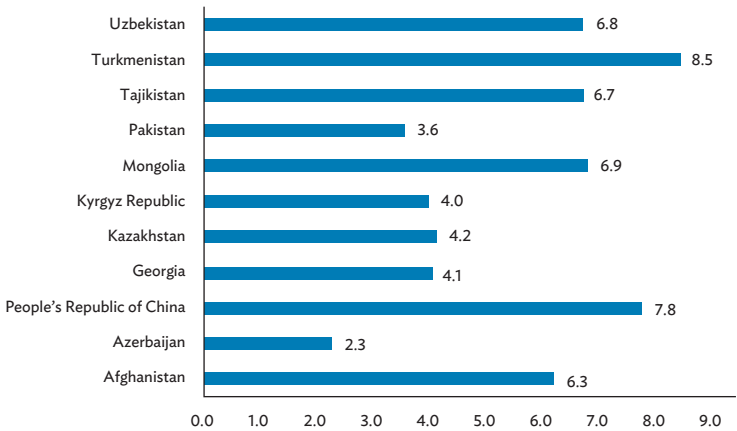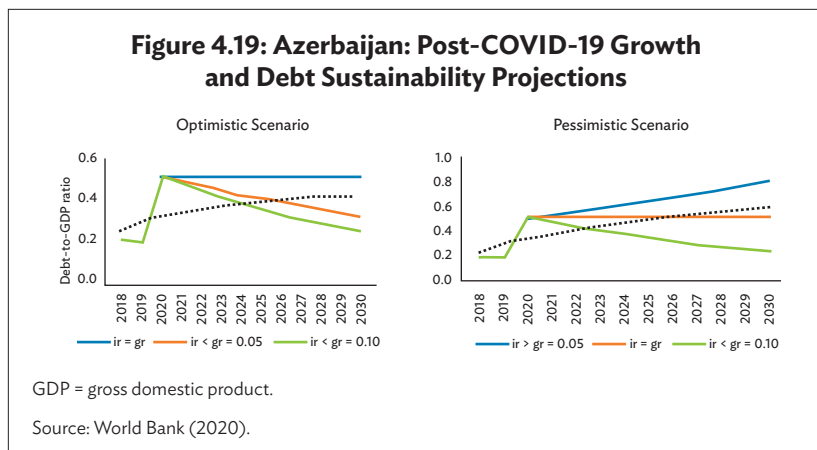

Figure 4.19: Azerbaijan: Post-COVID-19 Growth and Debt Sustainability Projections

GDP = gross domestic product.

Source: World Bank (2020).

In the baseline scenario, we assume: (i) the primary balance is close to zero and (ii) the historical real interest rate is 2.0%. Using these assumptions, we project the debt-to-GDP ratio until 2030. The debt-to-GDP ratio will decrease from 50% to 23% in 2030 if the government smoothly maintains the primary balance at a level close to zero. A sustainable debt level will be achieved with GDP growth higher than 4.5% annually and if the real interest rate does not exceed the historical real interest rate value.

The pessimistic scenario in Figure 4.19 assumes that: (i) the historical primary balance in the last decade is −3.35% of GDP and (ii) the historical real interest rate is 2.0%. The debt-to-GDP ratio will worsen in the case of a negative primary balance. With a historical real interest rate of 2.0%, 10% GDP growth is required to maintain the current level of the debt-to-GDP ratio. The debt-to-GDP ratio would reach nearly 80% of GDP with an interest rate of 10% and a GDP growth rate of 5%.

4.5.5 Georgia

With sustainable growth and a current account deficit, the Georgian economy has been strong enough to face the negative shocks. Georgia's debt remains sustainable, warranting low scrutiny under the emerging market debt sustainability analysis. The current debt-to-GDP ratio of Georgia is 47% of GDP, which is lower than the FRDL of 60% of GDP (see Figure 4.20). If the primary balance continues on its historical path, the Georgian economy will be able to maintain the debt sustainability and make sustainable debt services.

Figure 4.20: Georgia: Post-COVID-19 Growth and Debt Sustainability Projections: Optimistic Scenario

GDP = gross domestic product.

Source: World Bank (2020).
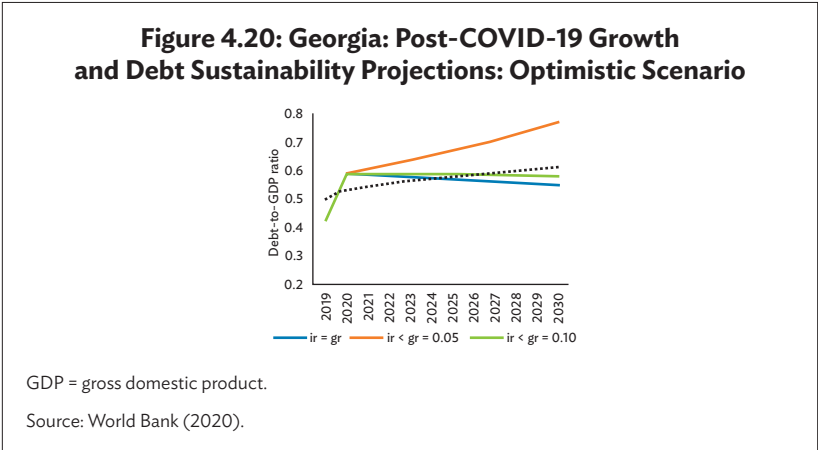
4.5.6 Tajikistan

Although it has declined significantly over the last decade, Tajikistan's debt burden remains high. However, Tajikistan's pattern of historical growth is about 5% to 6%. The robust growth in remittances, manufacturing, and the construction sector will support the country in maintaining the historical growth rate. The historical primary fiscal balance is about 1%. Our baseline scenario assumes that if the primary balance and GDP growth continue at 5% and 1% respectively, it will make Tajikistan's economy strong enough to achieve the sustainable level of debt. However, as shown in Figure 4.21, if the interest rate is higher than the growth and the primary balance increases from 1% to 2%, it will increase the risk of unsustainable debt dynamics in Tajikistan.

Figure 4.21: Tajikistan: Post-COVID-19 Growth and Debt Sustainability Projections

GDP = gross domestic product.

Source: World Bank (2020).
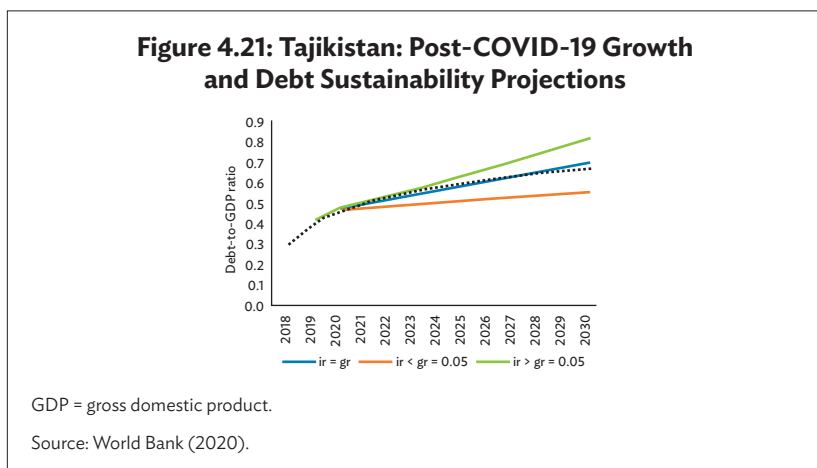
4.5.7 Other CAREC Countries

Except Mongolia, the rest of the CAREC countries (Uzbekistan, Turkmenistan, and Kazakhstan) are not experiencing high risks of external debt distress. The debt indicators of these countries remain below the relevant threshold set by the FRDL of 60% of GDP. Although exchange rate depreciation in low-risk CAREC countries would have a significant role in increasing the debt-to-GDP ratio, they would still be well below the FDRL threshold.

4.6 Conclusion

History and the COVID-19 era show that for most of the CAREC countries, debt has been accumulated. Debt service is one of the important factors contributing to debt accumulation depending on the size and structure of the economy. The analysis shows that current account deficits and exchange rate fluctuations are also contributing to debt accumulation that subsequently causes economic growth, employment, and inflation in most of the CAREC region.

Sustainable debt has been hampered by current account deficits; exchange rate fluctuations are also contributing to debt accumulation that subsequently adversely impacts economic growth, employment, and inflation in most of the CAREC region. The CAREC region also did not attract sufficient FDI to overcome trade deficits and reserve depletion, which has contributed further pressure on the country's balance of payments. Debt sustainability is highly dependent on underlying factors in each country. Therefore, holistic analysis varies for each CAREC country. A detailed commentary based on underlying factors may be required to derive a separate analysis based on both optimistic and pessimistic scenarios.

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Appendix 4.1

Figure A4.1: Gross Domestic Product per Capita
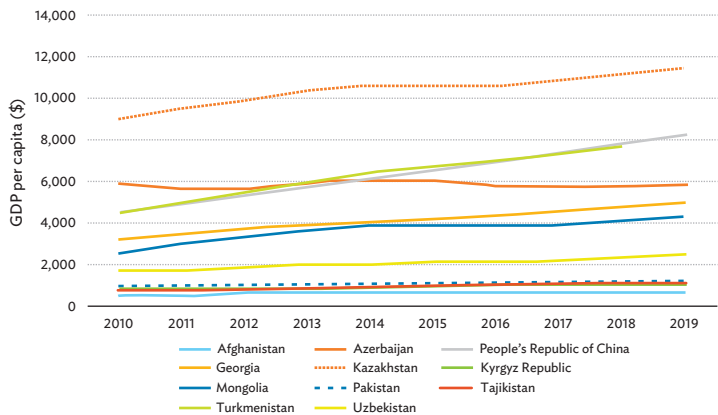
GDP = gross domestic product.

Source: World Bank (2020).

Figure A4.2: Gross Domestic Product Growth

GDP = gross domestic product.
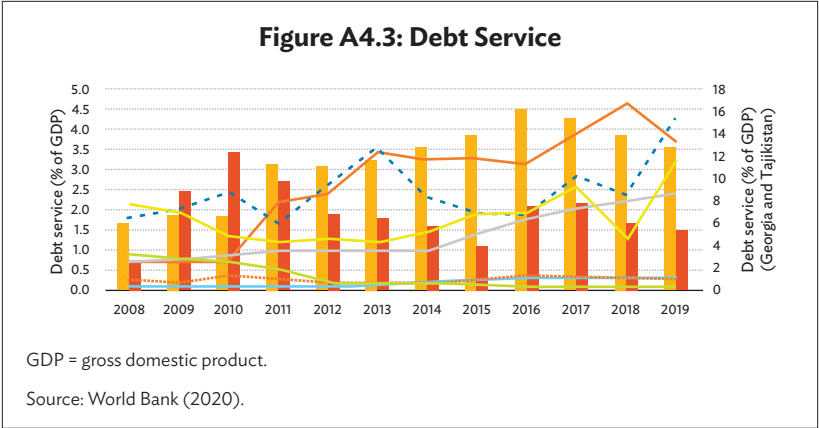
Source: World Bank (2020).

Figure A4.3: Debt Service

GDP = gross domestic product.

Source: World Bank (2020).

5

Impact of COVID-19 on Small and Medium-Sized Enterprises in Central Asia: Coping Strategies, Government Responses, and Policy Options

Falendra Kumar Sudan

5.1 Introduction

The coronavirus disease (COVID-19) crisis is unlike past crises. It has worldwide repercussions on economic activities (Kuckertz et al. 2020) including those of small and medium-sized enterprises (SMEs) (Bartik et al. 2020; Eggers 2020; Liguori and Pittz 2020; Kraus et al. 2020; Llanos-Contreras, Alonso-Dos-Santos, and Ribeiro-Soriano 2020). SMEs have been affected through the decline in consumption of goods and services, drop in revenue, financial market shocks, supply chain disruptions (SCDs), reduced hours of work, wage cuts, retrenching of workers, temporary closures (Bartik et al. 2020; CAREC Institute 2021), and severe job losses due to lockdown measures. SMEs resorted to available resources within firms (Tsilika et al. 2020) and also external and government support (CAREC Institute 2021) to cope with the crisis to remain agile and resilient. Financially constrained SMEs face higher survival risks (Liguori and Pittz 2020; Morgan, Nurgaliyeva, and Kydyrbayev 2021) amid pandemic-induced long-term uncertainty (Bartik et al. 2020), which has forced them to adapt (Liguori and Pittz 2020).

Firms' survival, uncertainty management, and exit from crisis require government support to counter the pandemic (Pacces and Weimer 2020).

In Central Asia, the national governments executed numerous measures including fiscal interventions such as tax deferment, easy credit, and cash relief to sustain business operations. However, lack of awareness of government support programs and inadequate government targeting and support remain a major issue. SMEs across the regional economies preferred simplified credit regimes, credit guarantees, interest-free or low-interest credit, credit repayment deferment, and enhanced tax benefits (CAREC Institute 2021). The pandemic crisis provides both an opportunity and a challenge to SMEs (Alon, Farrell, and Li 2020), and addressing these requires cooperation and knowledge sharing.

Only a limited amount of research has been done on the impact of the COVID-19 pandemic on SMEs, their coping strategies (Tsilika et al. 2020), and their resilience in the context of government support measures (Pacces and Weimer 2020) to mitigate their financial and nonfinancial constraints. Therefore, it becomes imperative to analyze the impact of the COVID-19 pandemic on SMEs, coping strategies they have adopted, and their resilience in post-pandemic business scenarios (Llanos-Contreras, Alonso-Dos-Santos, and Ribeiro-Soriano 2020). Against this backdrop, this study analyzed the macroeconomic structure, definitions of SMEs, the business environment, and role of SMEs including the pandemic's impact, coping strategies adopted, and governments' policy responses to support SMEs in selected Central Asian countries. The findings have policy implications for enabling SMEs in the region to become resilient, agile, and sustainable using their dynamic capabilities.

The study confirms that SMEs in Central Asian countries have been drastically affected by the pandemic crisis; they are unlikely to revert to a pre-crisis situation in the immediate aftermath of the COVID-19 pandemic, and the pandemic's impact is expected to persist in the near future. This is likely to hamper ongoing economic reforms, which emphasize the need for robust economic governance through sustained regional economic cooperation and integration. Unsustainable policies such as salary subsidies and tax deferrals are hard to depend on exclusively over the long term. Therefore, this chapter offers policy recommendations to practitioners to respond to the crisis in ways that build SMEs' agility and resilience. SMEs should adapt to the "new normal" economy spurred by government policy and incentives (ITC 2020). SMEs can discover novel and innovative options to be resilient during crisis-induced disruptions (Liguori and Pittz 2020). Firms can apply their dynamic capacities to maintain resilience and overcome uncertainty and crisis in the short term and long term. Robust policy frameworks to address the pandemic-induced impact on SMEs can offer new insights. To turn crisis into opportunity, the post-pandemic

"new normal" economy needs more suitable policies such as education, upskilling and reskilling of SMEs, digitalization, regional cooperation, and trade facilitation through liberal governments' support.

This chapter reviews the relevant literature and describes the framework of the study, its objectives and methodology. Next, we present the findings of the study and the policy implications. Finally, we discuss the study's contributions, limitations, and the future research agenda.

5.2 Literature Review

The lockdown induced by the COVID-19 pandemic has drastically impacted SMEs (Lu, Peng, and Lu 2020; Kraus et al. 2020; Kuckertz et al. 2020). SMEs have faced massive demand and supply shocks (CAREC Institute 2021; Paul and Chowdhury 2021) from the pandemic, which makes them highly vulnerable to economic downturn (Amankwah-Amoah, Khan, and Wood 2021). SMEs have faced operational shocks (Omar, Ishak, and Jusoh 2020), financial shocks (Robinson and Kengatharan 2020), consumption shocks (Stavins 2021), and business failures (Acharya and Steffen 2020).

Many SMEs have adopted coping strategies to tackle the crisis (CAREC Institute 2021; Thorgren and Williams 2020; Tsilika et al. 2020). These include reduced spending (Omar, Ishak, and Jusoh 2020), temporarily reducing the number of employees (CAREC Institute 2021; ITC 2020), temporary closures of business operations (Bartik et al. 2020; CAREC Institute 2021), and digitalization (Guo et al. 2020). Kuckertz et al. (2020) found that SMEs' coping strategies showed their innovation and resilience. Eggers (2020) researched the tactics and strategies SMEs used to stay in business during the pandemic. Gerald, Obianuju, and Chukwunonso (2020) found that SMEs used strategic agility to survive the pandemic crisis. Eggers (2020) reported that many SMEs used crisis management techniques to deal with impact of the crisis (Eggers 2020). CAREC Institute (2021) and Kraus et al. (2020) researched new business practices to survive and government responses to ease the impacts of lockdown to contain the pandemic (CAREC Institute 2021; Kraus et al. 2020).

The effects of government policies on the performance of SMEs have been less analyzed. Fiscal stimulus packages have been implemented in various countries in varied proportion to the gross domestic product (GDP), which correlates with GDP per capita and the number of COVID-19 cases. Many countries have introduced short-term work schemes, reduced employees' working hours, and implemented measures to support the self-employed (OECD 2020b). Despite government support, most SMEs faced reduced liquidity flows

(Robinson and Kengatharan 2020), restrictive credit (Eggers 2020; Kapparov 2021; Tilekeyev 2021), inadequate access to financial aid and information (Bartik et al. 2020; Eggers 2020; Kuckertz et al. 2020; Morgan, Nurgaliyeva, and Kydyrbayev 2021), and increased insolvency and bankruptcy (CAREC Institute 2021; Gössling, Scott, and Hall 2021). All these pose serious challenges for firms' survival (Kraus et al. 2020).

SMEs' debt may surge substantially due to debt financing instruments implemented by government policy measures to sustain businesses through the pandemic crisis. This increased debt may ruin businesses. Besides, with SMEs' limited resources to benefit from the frequent changes COVID-19 has induced in government policies, they struggle to adapt to the new conditions. The pandemic has led to an inescapable slowdown (Slater 2020). The duration and intensity of the slowdown depends on liquidity flows (Cowling, Brown, and Rocha 2020), job guarantees, and firms' viability and resilience (OECD 2020a) through government support until the recovery phase.

The scientific knowledge on mitigating the negative economic impacts of COVID-19 on SMEs remains limited. Mitigation strategies depend on how SMEs view the pandemic—as a threat or as an opportunity (Kraus et al. 2020). SMEs require innovative management models and use of digital technologies (Genberg 2020; Huang 2020) as survival strategies (Ting, Ling, and Hwa 2020). Most studies on the pandemic's impact on SMEs have been confined to developed countries (Bartik et al. 2020; Brown, Rocha, and Cowling 2020; Kraus et al. 2020; Kuckertz et al. 2020; Liguori and Pittz 2020). Only a few studies have analyzed SMEs' pandemic-induced survival strategies in developing economies (Le et al. 2020; Musa and Aifuwa 2020; Robinson and Kengatharan 2020). Further, studies focusing on the impact of the pandemic on Central Asia's SMEs and their survival strategies are scant. SMEs adopted coping strategies (CAREC Institute 2021; Tsilika et al. 2020) including relying on government support to respond to the crisis for survival and growth (Kuckertz et al. 2020). Despite this, SMEs faced considerable challenges to remain resilient in the long term (CAREC Institute 2021). The dynamic capacities of firms help them remain agile and resilient in times of crisis (Lu et al. 2020). The pandemic crisis and its impact on SMEs provide the theoretical structure for this study (Kuckertz et al. 2020). Gaps remain in extant studies to replicate in less-researched regions and countries. SMEs face a substantial challenge to respond to the crisis, which remains less researched. Similarly, the effectiveness of governments' policy measures to support firms' survival during lockdown and the implications of these measures need to be established (Kuckertz et al. 2020; Lu et al. 2020). This study is an attempt in this direction.

5.3 Objectives and Methodology

This study analyzes the impact of the COVID-19 pandemic on SMEs, coping strategies adopted by SMEs, and governments' responses to support SMEs in Central Asia. In this study, a meta-type methodology has been used to integrate, collate, and evaluate the pertinent research information from heterogeneous studies and databases. Meta-type methodology refers to collating and integrating the findings of multiple studies and blending a large quantity of data to address the prespecified research questions (Glass 1976). Meta-analysis is a component of a systematic review (Gough, Oliver, and Thomas 2017) and is widely used to integrate the findings of various studies (Appelbaum et al. 2018) due to its utility to policymakers (Cordray and Morphy 2009). The meta-type methodology used in this research includes the following steps: developing research questions, identifying and reviewing the relevant studies, and assessing and presenting the data. Policymakers, decision makers, and development practitioners depend heavily on the inferences drawn from meta-type research analyses. Researchers also depend on meta-type methodology to investigate research objectives and identify the gaps in extant research. Robust and action-oriented policy inferences have been drawn from the results of this meta-type analysis. The research framework used is this study is shown in Figure 5.1.

Figure 5.1: Research Framework

Develop Research Question	Identify Extant Research
Determine the primary and secondary objectives	Use rapid search approach / Scrutinize research studies / Select the most relevant studies

Mine and Collate Relevant Data	Assess and Present Data	Conclude
Sort data from existing research and databases	Pool data and information in tables and graphs for analysis	Infer the results / Draw the policy implications

Source: Author's creation.

Besides the meta-type approach, a descriptive method has been used for content analysis to triangulate the data and information from multiple sources. A descriptive approach has been applied to analyze a scenario in its present state specifically when extant information is scant. The secondary data and information have been collected from various national and international publications of the Asian Development Bank (ADB), Organisation for Economic Co-operation and Development (OECD), World Bank, and country reports of the governments of Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan using the data triangulation method. Data triangulation refers to the use of multiple data sources to investigate an identical event to avoid the probable prejudice that comes with applying a single data source and to enhance the legitimacy and soundness of the results. A deductive content analysis technique has been used to analyze the data and information. Knowledge on the impact of the pandemic crisis on SMEs is still evolving and scarce (Kraus et al. 2020). Qualitative research is indispensable in this crisis situation. Therefore, robust qualitative research is still needed to know how the pandemic affected SMEs and to draw out theoretical contributions and practical implications.

5.4 Findings of the Study

5.4.1 Macroeconomic Characteristics of Selected Central Asian Countries

The major macroeconomic data of selected Central Asian countries varied widely in various dimensions (Table 5.1). GDP has increased across the region due to rising private consumption and fixed investment in Kazakhstan, strong recovery in gold production in the Kyrgyz Republic, a surge in household consumption in Tajikistan, and fiscal consolidation and import substitution in Turkmenistan. In 2020, the gross national income (GNI) per capita ranged from $1,060 in Tajikistan to $8,680 in Kazakhstan, which reflected the differences in resource endowments in Central Asia. Table 5.2 and Table 5.3 provide the value added by sector and the trade structure, which also varied substantially across the selected Central Asian countries.

Table 5.1: Size of Selected Central Asian Economies, 2020

Economic Size	Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan
Population (million)	18.7	6.6	9.5	6.0	34.3
Surface area (sq. km '000)	2,724.9	200	141.4	488.1	447.4
Population density (per sq. km)	6.9	3.3	67.4	12.3	76.5
GNI, Atlas method (current $ billion)	162.7	7.6	10.0	42.9[a]	57.2
GNI per capita, Atlas method (current $)	8,680	1,160	1,060	6,740[b]	1,670
GDP (current $ billion)	169.8	7.7	8.1	47.3	57.7
GDP growth (annual %)	−2.6	−8.6	4.5	0.78	1.6
GDP per capita (current $)	9,055	1,173	859	7,967	1,685
GDP per capita growth (annual %)	−3.9	−10.5	2.1	10.07	−0.3

GDP = gross domestic product, GNI = gross national income.

[a] 2019 data.
[b] 2018 data.

Source: Author's compilation based on data from the World Bank, World Development Indicators (2021).

Table 5.2: Value Added by Sector of Selected Central Asian Economies, 2020

Value Added by Sector	Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan
Agriculture, forestry, and fishing, value added (% of GDP)	5.3	13.5	23.8	10.7[a]	26.1
Agriculture, forestry, and fishing, value added (annual % growth)	5.6	1.1	8.8	13.9[b]	3.0
Industry (including construction), value added (% of GDP)	33.1	29.5	32.8	42.0[a]	32.8
Industry (including construction), value added (annual % growth)	3.0	−10.5	9.2	29.3[b]	3.7
Manufacturing, value added (% of GDP)	12.7	17.0	13.0[a]	20.4[c]	20.1
Manufacturing, value added (annual % growth)	3.9	− 7.2	5.0[d]	...	7.1
Services, value added (% of GDP)	55.8	49.6	35.3	47.1[a]	33.5
Services, value added (annual % growth)	−5.6	−9.9	2.3	13.6[b]	−0.1

GDP = gross domestic product.

[a] 2019 data.
[b] 2005 data.
[c] 2004 data.
[d] 1999 data.

Source: Author's compilation based on data from the World Bank, World Development Indicators (2021).

Table 5.3: Trade Structure of Selected
Central Asian Economies, 2020

Trade Structure	Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan
Merchandise exports (current $)	46.4	1.9	1.8	7.1	13.2
Merchandise imports (current $)	37.2	3.6	3.1	3.2	20.0
Merchandise trade (% of GDP)	49.3	73.0	60.4	27.8[a]	57.7
Commercial service exports (current $)	4.8	1.1a	0.1	...	1.6
Commercial service imports (current $)	7.9	1.0[a]	0.4	...	3.4
Trade in services (% of GDP)	7.7	23.7[a]	6.7	...	9.0

GDP = gross domestic product.

[a] 2019 data.

Source: Author's compilation based on data from the World Bank, World Development Indicators (2021).

Growth of the merchandise trade varied significantly across Central Asia (Table 5.4). Table 5.5 reveals how trade facilitation, trade barriers, and structural policies affected economic diversification and trade in selected Central Asian economies. Import substitution and high trade barriers have failed to diversify domestic production structures because of the limited market size. Therefore, diversification needs to be outward oriented and should be facilitated by regional integration. Export diversification and export competitiveness are closely linked to imports, which strengthen global value chains (GVCs). However, import barriers hindered exports. Therefore, trade barriers should be eliminated for SMEs' development across Central Asia.

Table 5.4: Average Annual Growth of Merchandise Trade
in Selected Central Asian Economies, 2009–2019

Merchandise Trade	Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan
Export volume (%)	0.4	−0.6	−0.5	5.4	−0.5
Import volume (%)	−0.4	3.8	1.0	−9.3	7.3
Export value (%)	−2.3	−0.1	−0.5	0.9	−0.4
Import value (%)	−0.7	3.3	0.9	−9.5	6.9
Export value index, 2019 (2,000 = 100)	650.3	384.7	159.2	386.8	497.8
Import value index, 2019 (2,000 = 100)	749.1	878.6	496.2	163	810.7

Source: Author's compilation based on data from the World Bank, World Development Indicators (2021).

Table 5.5: Trade Facilitation and Barriers
in Selected Central Asian Economies, 2020

	Kazakhstan	Kyrgyz Republic	Tajikistan	Uzbekistan
Trade Facilitation				
Time to export: Border compliance (hours)	105	5	27	32
Cost to export: Border compliance ($)	470	10	313	278
Time to export: Documentary compliance (hours)	128	72	66	96
Cost to export: Documentary compliance ($)	200	110	330	292
Time to import: Border compliance (hours)	2	69	107	111
Cost to import: Border compliance ($)	0	499	223	278
Time to import: Documentary compliance (hours)	6	84	126	120
Cost to import: Documentary compliance ($)	0	200	260	242
Trading across borders (Change in score % points)	0	0	1.8	8.4
Ease of doing business index (1–100)[a]	25	80	106	69
Logistic performance index (1–5)[b]	2.81	2.55	2.34	2.58
Trade Constraints[a]				
Primary products (simple mean tariff)	11.2	15.7	4.7	15.5
Primary products (weighted mean tariff)	2.6	3.8	1.0	12.7
Manufactured products (simple mean tariff)	4.6	4.1	5.1	13.5
Manufactured products (weighted mean tariff)	2.3	2.9	6.8	8.4
Clearance of direct exports through customs (days)	9.0	1.8	2.1	3.7
Firms exporting directly or indirectly, at least 10% of sales (%)	5.7	16.7	7.8	6.4
Firms exporting directly, at least 10% of sales (%)	3.9	9.9	3.1	5.0
Proportion of total sales exported directly (%)	2.0	5.9	1.4	2.5
Imports clearance from customs (days)	13.7	5.3	4.2	10.1
Firms using materials/inputs and/or supplies of foreign origin (%)	59.7	76.7	43.5	41.7
Proportion of total inputs of foreign origin (%)	31.7	48.7	30.9	20.8
Custom and trade regulations as a major constraint (%)	4.9	15.3	2.5	3.6

[a] 2019 data.
[b] 2018 data.

Source: Author's compilation based on data from the World Bank, World Development Indicators (2021).

5.4.2 Definition of Small and Medium-Sized Enterprises in Selected Central Asian Countries

The definition of SMEs varied across the selected Central Asian countries (Table 5.6), which complicated comparative analysis. Generally, an SME is defined on the basis of the number of employees and annual turnover. In Kazakhstan and the Kyrgyz Republic, SMEs are defined on this basis, while in Turkmenistan and Uzbekistan, SMEs are defined only on the basis of the number of employees. In small enterprises, the maximum number of employees varied from 30 in Tajikistan to 100 in Kazakhstan and Uzbekistan, while in medium enterprises the maximum number of employees varied from 50 in the Kyrgyz Republic to 250 in Kazakhstan

Table 5.6: Small and Medium-Sized Enterprise Definitions in Selected Central Asian Countries

Countries	Micro		Small		Medium	
	Employees (Number)	Annual Turnover (Domestic Currency)	Number of Employees	Annual Turnover (Domestic Currency)	Number of Employees	Annual Turnover (Domestic Currency)
Kazakhstan	< 15	< T72.15 million	< 100	< T721.5 million	101–250	< T7,215.0 million
Kyrgyz Republic	< 15[a] and < 7[b]	< Som150,000[a] and < Som230,000[b]	15–50[a] and 7–15[b]	Som150,001–Som500,000[a], Som230,001–Som500,000[b]	51–200[a] and 16–50[b]	Som500,000–Som2 million[a], Som500,000–Som2 million[b]
Tajikistan	…	…	< 31	Up to TJS500,000	31–200	Between TJS500,000 and TJS15,000,000
Turkmenistan	…	…	50[c], 10[d], and 25[e]	…	…	…
Uzbekistan	< 26	…	26–100	…	101–250	…

Note: For March 2021, average T425.58 = $1; Som84.79 = $1.00; and TJS11.4035 = $1.

[a] Refers to production sector comprising agriculture, energy, construction, mining, and processing.

[b] Refers to trade, transport, communication, education, health care, and finance.

[c] Refers to enterprises engaged in production of goods for industrial/technical consumption, public consumption, and constructional and maintenance-constructional activities.

[d] Refers to enterprises engaged in wholesale and intermediary and supplying activities.

[e] Refers to enterprises engaged in other types of activities.

Sources: Author's compilation based on data from the Code of the Republic of Kazakhstan (2015); Decree of the Government of the Kyrgyz Republic, "On the Basic Scheme of the Classifier of Types of Enterprises" No. 78 of 17 February 1998, in the version of Decree No. 590 on 29 August 2002; the Law of the Republic of Tajikistan "On the State Protection and Support of Entrepreneurship" (Article 5); for Turkmenistan statements of the Mejlis of Turkmenistan, 2009 г., no. 3, p. 58) (with changes and additions made by the laws of Turkmenistan dated 29.08.2013 № 429-IV, no. 84 03.05.2014-V, 28.02.2015, no. 193-V and 26.03.2016, no. 385-V; and the Uzbekistan Draft Presidential Resolution "On Measures to Further Stimulate the Expansion of Small Businesses and Private Entrepreneurship in Order to Create Competitive Companies."

and Uzbekistan. The definition of SMEs in the Central Asian countries applies to formal enterprises; most informal individual entrepreneurs or peasant farmers are not covered. Therefore, the share of registered SMEs in agriculture remains very low in these countries and informal SMEs are not covered under the special programs applicable to SMEs.

5.4.3 Business Environments in Selected Central Asian Countries

The striking contrasts in business environments across Central Asia are presented in Table 5.7. SMEs have faced challenging business environments due to cost constraints in the enforcement of contracts, burdensome regulations, noncompetitive procurement practices, and frequent inspections, which often served as opportunities for corruption and hindered economic diversification and the ability to attract foreign

**Table 5.7: Business Environment in
Selected Central Asian Economies, 2020**

Business Environment	Kazakhstan	Kyrgyz Republic	Tajikistan	Uzbekistan
Regulations and tax: Dealing with government regulations (% of senior management time)	4.3	11.3	10.7	4.9
Regulations and tax: Number of visits or required meetings with tax officials	2.3	2.4	4.3	2.9
Permits and licenses: Time required to obtain operating license (days)	26.0	23.9	15.9	15.7
Corruption: Bribery incidence (% of firms)	11.6	31.4	11.1	5.9
Crime: Losses due to theft, robbery, vandalism, and arson (% sales)	4.1	5.9	4.5	6.8
Informality: Firms competing against unregistered firms (% of firms)	39.2	51.4	11.8	21.5
Gender: Firms with female top manager (% of firms)	26.0	32.5	6.6	12.4
Finance: Firms using banks to finance working capital (% of firms)	13.2	18.8	12.8	23.7
Infrastructure: Value lost due to electrical outages (% sales)	1.7	1.1	0.6	3.0
Trade: Average time to clear exports through customs (days)	9.0	1.8	2.2	3.7
Workforce: Firms offering formal training (% of firms)	21.8	41.4	24.3	16.9

Source: Author's compilation based on data from the World Bank, World Development Indicators (2021).

capital. At the same time, governments have made SMEs' development a priority by enhancing overall business environments, improving access to finance, developing information and communication technology (ICT) infrastructure, streamlining and eliminating administrative procedures, and simplifying and reducing the tax burden. All of this has led to significant improvement in doing business indicators in the regional economies.

The divergences across doing business indicators in the Central Asian economies are shown in Table 5.8. According to the World Bank's Doing Business assessment (2019), the Kyrgyz Republic ranked 70th, below Kazakhstan (28th) but ahead of Uzbekistan (76th) and Tajikistan (126th). SMEs have faced problems regarding access to electricity, paying taxes, and enforcing contracts including skilled personnel, corruption, and competition from the informal sector. SMEs engaged in the informal economy are particularly vulnerable due to overcomplicated procedures. Therefore, the diverse regional economic structure and strong spatial disparities in business environments have called for robust doing business reforms. SMEs engaged in cross-border trade for export promotion urgently need an enabling business environment.

Table 5.8: Doing Business Indicators in Selected Central Asian Economies, 2020

Doing Business Indicators	Kazakhstan	Kyrgyz Republic	Tajikistan	Uzbekistan
Starting a business: Number of procedures	4	4	3	3
Starting a business: Time required (days)	5.0	10.0	7.0	3.0
Starting a business: Cost (% of per capita income)	0.2	1.4	17.5	2.2
Registering property: Number of procedures	4	3	4	9
Registering property: Time required (days)	4.5	3.5	33.0	43.0
Building a warehouse: Number of procedures	17	17	26	17
Building a warehouse: Time required (days)	102.5	167.0	157.0	246.0
Enforcing contracts: Time required (days)	370	410	430	225
Protecting investors: Disclosure index (1–10)	9	7	8	8
Resolving insolvency: Time required (years)	1.5	1.5	1.7	2.0

Source: Author's compilation based on data from the World Bank, World Development Indicators (2021).

The Central Asian countries have experienced rapid penetration of ICT in the business landscape (Table 5.9). However, the number of individuals using the internet and the availability of secure internet servers were quite low in Turkmenistan, Tajikistan, and the Kyrgyz Republic, which reflected limited use of internet for e-commerce and information sharing. Therefore, most SMEs failed to capitalize on ICT. Central Asian countries have few transborder fiber-optic links, which restricted their global connectivity, reduced local internet availability, and impeded SMEs' integration into GVCs. SMEs' capacity to innovate and improve competitiveness has also been reduced. Therefore, there is a need to increase telephone and internet access of SMEs and integrate them into the digital economy to seize the opportunities created by growth of ICT. This can lower their entry costs, reduce interventions of intermediaries, and improve transparency, accountability, and efficiency. Besides, SMEs can use the internet for online banking and financial services to improve their competitiveness, integrate into GVCs, and diversify.

**Table 5.9: Telephone and Internet Access and Use
in Selected Central Asian Economies, 2020**

Telephone and Internet Access and Use	Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan
Fixed telephone (subscriptions per 100 people)	16.5[c]	5.0[c]	5.4[a]	11.8[a]	10.7[c]
Fixed broadband (subscriptions per 100 people)	13.5[c]	4.2[c]	0.07[a]	0.09[a]	13.9[c]
Mobile cellular (subscriptions per 100 people)	138.6[c]	134.0[c]	111.5[a]	162.9[a]	101.2[c]
Individuals using internet (% of population)	81.9[c]	38.2[a]	22.0[a]	21.3[a]	55.2[b]
Secure internet servers (per million people)	3307.6[d]	420.3[d]	92.3[d]	47.4[d]	468.7[d]

[a] 2017 data.
[b] 2018 data.
[c] 2019 data.
[d] 2020 data.

Source: Author's compilation based on data from the World Bank, World Development Indicators (2021).

5.4.4 Contributions of Small and Medium-Sized Enterprises in Selected Central Asian Countries

The status of SMEs' contributions to GDP, employment, value added, and exports are presented in Table 5.10. SMEs accounted for more than 90% of registered firms, contributed from one-fourth to more than half of GDP and more than one-fifth to three-fourths of employment across Central Asia. Except in the Kyrgyz Republic, SMEs' share of GDP remained lower than their contribution to employment, which reflected their low productivity, specifically in the resource-rich economy of Kazakhstan (Morgan, Nurgaliyeva, and Kydyrbayev 2021), where SMEs contributed 28.9% of GDP in 2018. In the Kyrgyz Republic, SMEs contributed 41.5% of value added to GDP in 2018 largely linked to growth in the wholesale and retail trade sectors. In 2018, SMEs contributed 30% of GDP and generated 35% of employment in Tajikistan (Mirzoev

Table 5.10: Contribution of Small and Medium-Sized Enterprises in Selected Central Asian Economies, 2018

SMEs' Contribution	Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan
Number of SMEs	1,569,331[a]	855,989[b]	300,000[c]	...	230,000
% of firms	96.7	99.0	99.0	...	90.0
SMEs per 1,000 citizens	12.0	28.3	14.3	...	10.5
Firms registered in 2018	23,464	4,936	831	...	35,968
Entry density in 2018	2.00	1.27	0.15	...	1.63
Domestic credit to firms in 2019 (% of GDP)	24.3	25.8	11.8	...	30.0
% of GDP	28.9	41.5	30.0	45.0[d]	55.0
% of employment	37.5	21.2	35.0	60.0[d]	80.0
% of exports	...	39.3	...	...	27.2
Value added of SMEs	26.8%	41.5%	...	...	$113,000

GDP = gross domestic product, SME = small and medium-sized enterprise.

[a] Refers to 377,925 small firms, 2,787 medium-sized firms, and 1,188,619 individual entrepreneurs and farms.
[b] Refers to 15,289 small and medium-sized firms, 401,700 individual entrepreneurs, and 439,000 peasant farms.
[c] Of this, the registered firms were only 30,000.
[d] Data pertains to micro, small, and medium-sized enterprises (MSMEs). However, during 2011–2015, SMEs' contribution to GDP was 21% and their contribution to employment was and 30%.

Sources: Author's compilation based on data from the Ministry of National Economy on Implementation of Business Roadmap 2020; Statistics Committee of the Ministry of National Economy of Kazakhstan; National Statistical Committee of the Kyrgyz Republic; Agency for Statistics under the President of the Republic of Tajikistan; Szabó (2003) for Turkmenistan; State Statistics Committee of the Republic of Uzbekistan; and Concept of the Development Strategy of the Republic of Uzbekistan.

and Sobirzoda 2021). In Uzbekistan, SMEs generated substantial employment (Tadjibaeva 2021), which remained higher than the 70% of employment provided by SMEs on average in OECD countries in 2018. Most SMEs in Uzbekistan remained confined to agriculture, followed by services and manufacturing, and contributed substantially to GDP growth facilitated by tax reduction, simplified business registration and licensing, and easier access to finance. SME exports have also surged significantly due to simplifying of customs procedures, export financing, and export promotion.

In brief, SMEs' potential remained untapped, which provided immense opportunities for economic diversification in the Central Asian countries (Morgan, Nurgaliyeva, and Kydyrbayev 2021). Most SMEs have been engaged in subsistence entrepreneurship, lacked innovation, experienced unfair competition from the informal sector, lacked an adequately educated workforce, and faced credit constraints. Therefore, governments should create a robust system to stimulate and support SMEs' development by promoting research and innovation, minimizing regulation, removing barriers, and protecting and promoting entrepreneurs and small businesses to grow into medium-sized enterprises. Regional cooperation is required to improve business environments, management training and consultancy, business advisory services, and SME internationalization.

5.4.5 Impact of COVID-19 Pandemic on Small and Medium-Sized Enterprises

The Central Asian countries have faced extraordinary challenges posed by the COVID-19 crisis with simultaneous demand shocks and SCDs (CAREC Institute 2021). SMEs in the Central Asian region have been impacted through both internal factors, such as lockdown-induced business disruptions, lower consumption, impacts on the real economy (Amankwah-Amoah, Khan, and Wood 2021; CAREC Institute 2021; Kraus et al. 2020; Kuckertz et al. 2020; Lu et al. 2020; Paul and Chowdhury 2021), and external factors such as volatile international market prices, border closures, and trade restrictions (Abiad 2020). SMEs across countries and sectors have been the worst affected by SCDs (WTO 2020) due to heavy dependence on suppliers from the People's Republic of China (PRC) and other Asian countries, where complete lockdowns were imposed to contain the pandemic. Domestic and international transport disruptions have also affected SMEs severely. Except in Turkmenistan, SMEs in the regional economies have been affected by trade slowdowns. Kazakhstan's SMEs in the trade, tourism, and catering sectors employ more than 1.6 million workers and have been the worst

affected by the pandemic. The pandemic has significantly weakened Tajikistan's economy due to the decline in domestic consumption and the fall in output for firms, including SMEs in the transport, tourism, retail, and finance sectors. SMEs dependent on imports of raw materials and intermediate goods have faced severe SCDs. In Uzbekistan, 80% of SMEs suspended their activities due to nationwide lockdown. In the Kyrgyz Republic and Tajikistan, many SMEs have temporarily closed their businesses. Informal businesses have been the worst affected. In Kazakhstan, SMEs employ about 3.3 million workers. Nearly 70% of SMEs have suspended their business operations and about 2.2% of SMEs have completely closed their operations during the lockdown. More than 70% of the self-employed workers have suspended their activities (OECD 2020c).

The Central Asian SMEs in transport, manufacturing, construction, wholesale and retail trade, hospitality, food services, real estate, professional services, and other personal services have been hit hard by the pandemic. SMEs in these sectors account for significant employment across the Central Asian region. The vast majority of workers in sectors such as hospitality, tourism, transport, wholesale and retail trade, and repairs have faced high risks of layoff due to lockdown measures (ILO 2020a). In the Central Asian countries, SMEs involved with products such as office equipment, electronics, chemicals, petroleum, and plastic have been especially impacted through SCDs in international trade. SMEs have been severely affected due to operational and liquidity constraints. SMEs have also faced spillovers in financial markets, which reduced business confidence and credit supplies, increased their financial vulnerability, and lowered resilience (OECD 2020c). The extended restrictions have led to liquidation of many SMEs in retail, cultural, and leisure activities. Many SMEs have experienced bankruptcies in the Central Asian countries as a consequence of the pandemic (OECD 2020d), which led to substantial closures of businesses (Bartik et al. 2020) in the wholesale and retail, professional services, transportation and storage, information and communication, and construction sectors.

In Central Asia, a large proportion of female-owned SMEs has been confined to the informal sector, lacking social or legal protection. The COVID-19 pandemic-induced social distancing restrictions disproportionately affected the female-owned SMEs in travel, tourism, retail, and hospitality activities (ILO 2020b). The supply and demand disruptions in the garment industry forced the closures of women-owned SMEs (OECD 2020e). Female-owned SMEs lack financial liquidity, digital capacities, and resilience to adapt, which increased the risk of business closures during extended disruptions. Female-owned SMEs in informal activities have been unable to access the much-needed

online financial support due to poor digital literacy, which reduced the likelihood of business survival (OECD 2020f). Most self-employed female workers faced the problem of harmonizing entrepreneurial tasks with increased household responsibilities and childcare, which forced more self-employed women to exit the workforce compared to self-employed men. For instance, a significant proportion of women-owned enterprises were closed temporarily or permanently in India due to pandemic, and those closed permanently were not likely to reenter entrepreneurial ventures (Bargotra et al. 2021). In Africa, a high proportion of female-owned SMEs experienced zero income compared to male-led SMEs (Abebe, Bundervoet, and Wieser 2020; Ebrahim et al. 2020). Women-led SMEs in the informal sector suffered substantial revenue loss due to significant declines in sales (Abebe, Bundervoet, and Wieser 2020) and liquidity crunches (Torres et al. 2021), which increased the losses (Ebrahim et al. 2020). Many women reduced the time spent on business-related tasks and increased the time spent on familial and childcare work to cope with the crisis (Torres et al. 2021). Overall, female-owned SMEs have experienced disproportionately substantial losses and may have problems with future productivity growth if female entrepreneurs do not experiment and adapt.

The extended containment measures have led to massive liquidity shortages and bankruptcies for smaller, younger, and less productive firms. Start-up firms have been particularly affected by the rapid decline in start-up activity and investment. Self-employed workers across Central Asia have suffered badly from lockdown policies, and business operations in specific sectors such as tourism, hospitality, personal services, construction, and small-scale manufacturing have been disproportionately affected (Abiad 2020; OECD 2020c). In particular, informal microenterprises have borne most of the brunt of the pandemic crisis, although SMEs have been adversely affected. The governments' fiscal stimulus measures have partially neutralized the adverse effects on SMEs (CAREC Institute 2021). The vast majority of SMEs in Central Asia rely on domestic consumption. Therefore, domestic consumption would appear to be a priority for economic revival and recovery with potential support measures (Pacces and Weimer 2020). Informal SMEs may not have benefited from government-supported stimulus measures. Therefore, government policies and programs should address informality and labor market inequalities for the future economic resilience of the Central Asian countries.

Most SMEs have also been recovering, albeit slowly, from the impact of the pandemic. Many SMEs have already resumed operations and most workers have returned to work. Most SMEs in the Central Asian countries have limited resilience and flexibility to switch to teleworking

and digitalization due to associated high costs in accessing and adopting technologies. Besides, SMEs have faced greater difficulties in accessing information not only on how to deal with the pandemic spread, but also on potential business strategies to alleviate the crisis (Kuckertz et al. 2020) and seek government support (CAREC Institute 2021; CERR and UNDP 2020). Operational difficulties faced by SMEs may push viable enterprises to bankruptcy (Gössling, Scott, and Hall 2021) by dampening productivity, employment, and growth (Abiad 2020; OECD 2020c). SMEs' risk of default increases if the financial sector deleverages and reduces liquidity in the uncertain economic environment. Therefore, government stimulus measures are necessary to avoid large-scale closure of SMEs (Bartik et al. 2020) and permanent layoff of the workers. In the Central Asian countries, SMEs' participation in international trade continues to be limited due to lack of relevant skills, bulky regulations, customs procedures, and limited access to trade finance (Morgan, Nurgaliyeva, and Kydyrbayev 2021), which are expected to increase the negative effects of the COVID-19 pandemic. These barriers need to be addressed to tap the trade opportunities for speedier economic recovery.

5.4.6 Coping Strategies Adopted by Small and Medium-Sized Enterprises

In the beginning of the crisis, SMEs in Central Asia adopted safety measures to protect workers and customers against the pandemic. Many SMEs have closed down temporarily (Bartik et al. 2020) and approached the government for support (Kraus et al. 2020). Besides common measures, SMEs have diverged in their coping strategies (CAREC Institute 2021; Tsilika et al. 2020). Some have adopted retreating coping strategies (Eggers 2020), while many have remained resilient, and some have proved remarkably agile (Gerald, Obianuju, and Chukwunonso 2020). Retreating strategies have not accounted for the long-term impacts of the coping strategies, while resilient and agile coping strategies promote the competitiveness of SMEs (Tsilika et al. 2020). Resilient SMEs have maintained or temporarily closed down their business operations to fully resume later by resorting to backup products, suppliers, or markets. Resilient coping strategies can produce a virtuous cycle as a firm reinforces its capacity to deal with new business realities in crisis (Kuckertz et al. 2020). Most SMEs have failed to adopt agile strategies to the crisis and adopted retreating coping strategies, which led them to liquidity crunches and bankruptcy (Gössling, Scott, and Hall 2021). Therefore, SMEs should adapt to the crisis in an agile manner, for which government-assisted programs must be encouraged (CAREC Institute 2021). In the Central Asian countries, most SMEs

have faced severe constraints in access to finance (Kapparov 2021; Mirzoev and Sobirzoda 2021; Morgan, Nurgaliyeva, and Kydyrbayev 2021; Tadjibaeva 2021), cash flows (Liguori and Pittz 2020), and SCDs in normal business operations, which have immensely increased due to spread of the pandemic and government-imposed restrictions. Figure 5.2 shows the various coping strategies that SMEs have adopted in response to the pandemic-induced economic shutdown.

Figure 5.2: Coping Strategies Adopted by Small and Medium-Sized Enterprises

Source: Compiled by the author.
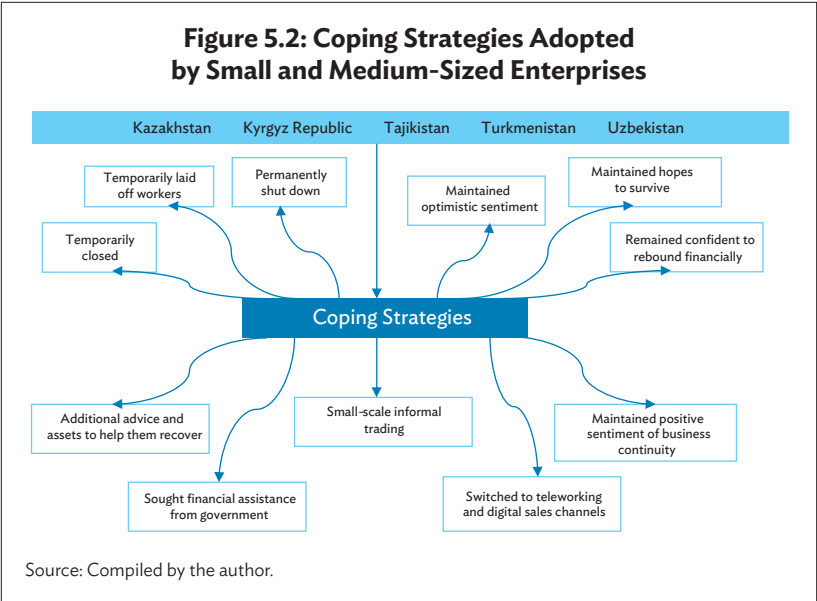
The government-imposed lockdown measures have forced many SMEs to temporarily or permanently cease their business operations to cope with the effects of the pandemic, with significant variations across Central Asia due to differences in the intensity of COVID-19 outbreaks, policy responses, and economic characteristics across countries (CAREC Institute 2021). SMEs that preferred to keep their businesses open also faced cash flow constraints due to reduced sales and opted to reduce their workforce temporarily to offset difficulties in paying business expenses. A high proportion of consumer-focused SMEs operating hotels, cafés, and restaurants reduced their workforce in direct response to government-imposed lockdown measures in

many Central Asian countries and operated significantly below normal capacity for an extended time. The retention or reduction of workforce in SMEs depended on cash flows and partial wage payments to employees during closure. It was influenced by the timing and intensity of business closure (Bartik et al. 2020) and level of governmental support (Pacces and Weimer 2020). Some SMEs preferred to rehire the same workers after resumption of normal business operations and thus paid them partial wages.

SMEs have limited cash reserves and access to financing (Morgan, Nurgaliyeva, and Kydyrbayev 2021), which forced them to depend on governments for financial support in varied proportion across the Central Asian countries. A high proportion of SMEs received financial support in the form of loans or grants including unemployment benefits extended to workers, which eased some of their immediate cash flow constraints (ADB 2020a). However, none of the government measures had universal coverage and the informal SMEs have remained outside the ambit of the support packages. SMEs have faced exceptional challenges due to severe demand and supply disruptions including finance constraints in the context of the COVID-19 pandemic, which compelled them to adapt to the changing economic environment to recover once normal capacity is achieved (Abiad 2020; OECD 2020c). SMEs are evolving their strategies to reopen and attempting to develop their digital capabilities even amid uncertainty. Most SMEs in Central Asia remained optimistic about their business prospects in the future and retained some degree of optimism. However, some uncertainty remains as to SMEs' ability to reach their optimal business capacity, which will be determined by the extent of government support (Pacces and Weimer 2020) and the resumption of normal demand and supply. Despite strong optimism, many SMEs still face substantial challenges in business recovery due to constraints such as demand and supply, cash flow, and loan repayments. Despite all these challenges, most SMEs have reopened and adjusted their business operations to adapt to the new economic environment using digital channels.

5.4.7 Country-Specific Policy Responses to Support Small and Medium-Sized Enterprises

The Central Asian countries have implemented policy responses covering fiscal policy and macro-financial policy to address the COVID-19 pandemic crisis, as shown in Figure 5.3. All the Central Asian countries have also announced economic support packages to support SMEs to minimize the economic impact of the pandemic on businesses, as shown in Figure 5.4. Many countries have urgently

deployed measures to support SMEs in sustaining short-term liquidity. Some countries have initiated more general policies to cushion the blow for SMEs (OECD 2020d). The central banks of the Central Asian region have implemented monetary measures to enable the commercial banks to extend more loans to SMEs (ADB 2020b, 2020c). Figure 5.5 shows the many SME-specific policy measures that Central Asian countries have implemented.

In Kazakhstan, banks allowed SMEs to suspend payments in the grace period for debt and fees without additional bank loan agreements by submitting an application to banks along with documents confirming deterioration of financial standing via by e-mail, online bank–client system, internet portal, mobile application, or other means of communication during the second quarter of 2020 (ADB 2020d; Government of Kazakhstan 2020; Tazetdinova 2020). The National Bank of Kazakhstan (NBK) has carried out financing of commercial banks to support SMEs. The Soft Loan Program for SMEs has been implemented by the Kazakhstan Sustainability Fund with financial support of T600 billion from NBK to support second-tier banks at an interest rate of 5% per annum up to a period of 1 year for financing SMEs not exceeding T3 billion and individual entrepreneurs not exceeding T50 million based on predefined procedures (IMF 2020a). Other measures implemented

Figure 5.3: Policy Responses to the Pandemic in Central Asia

Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan

Fiscal Policy

| Expanding energy subsidies | Exempting or postponing rent payments or property and land taxes | | Deferring or exempting tax declarations and payments | Strengthening unemployment benefits |
| | | | | Providing subsidized loans |

Monetary Policy

Cutting policy interest rate		Cutting policy interest rate		Cutting policy interest rate
Repo arrangements, liquidity support and refinancing		Injecting liquidity		Injecting liquidity
		Expanding lending tools		

Macro-Financial Policy

Easing countercyclical buffers or liquidity ratio			Financing to public sector	
Lowering capital adequacy				
Relaxing loan classification and provisioning				

Source: Compiled by the author.

Figure 5.4: Economic Support Packages to Small- and Medium-Sized Enterprises

Source: Compiled by the author.

to stabilize the economy and support the SMEs include a lower value-added tax rate; exemption from paying excise duties for gasoline (except aviation gasoline) and diesel fuel sold for export; reduced property tax rates in the tourism, public catering, and hospitalities sectors; and tax deferral for social taxes and other mandatory taxes for a specific period. SMEs have also been provided social payments benefits to stabilize Kazakhstan's economy (Agaidarov, Izvorski, and Rahardja 2020; ICC 2020).

The National Bank of the Kyrgyz Republic has allocated Som5.2 billion to support the economy including Som750 million for SMEs. A project providing emergency support for MSMEs has been allocated $50 million including $13 million for a portfolio partial credit guarantee for MSME loans from financial institutions during the crisis and the post-crisis recovery. The government has allocated $176 million for preferential financing to SMEs in export-oriented, processing, and food security sectors and introduced a temporary ban on bankruptcy procedures of SMEs for a specified period (IMF 2020b). The government of the Kyrgyz Republic has developed and adopted an anti-crisis program to stabilize the economy and support SMEs for a specific period (World Bank 2020). The program includes preserving the banking system, raising aid from international organizations, structural reforms targeting businesses, simplifying the tax system, reforming the tax and customs services, transitioning to digital inspections of businesses, cashless payments, and limiting the informal economy (Vinokurov, Lavrova, and Petrenko 2020). The National Bank of the Kyrgyz Republic has introduced credit holidays, reduced interest rates, provided deferrals on disbursed loans, suspended accrual of interest and

late payment fees, and allowed repayment of loans at the pre-crisis dollar exchange rate (EBRD 2020). The government has also implemented postponement of tax payments, time-bound exemptions of property and land taxes, temporary tax exemptions for SMEs, and subsidized credit to banks to provide funding to SMEs through soft loans (IMF 2020b; ADB and UNDP 2020). The government has provided discounts to

Figure 5.5: Policy Responses to Support Small- and Medium-Sized Enterprises in Central Asia

Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan
Suspension of principal debt and fees	Structural fiscal reforms	Tax break	Resource mobilization from international financial institutions	Extended guarantees and compensations for interest expenses
Soft loan program	Credit holidays and reduced interest rates	Suspended surcharge for late payment of taxes	Expanding functions of regional support business centers	Additional infrastructural projects
Deferred tax payments	Deferrals of interest on disbursed loans	Exempted rent payment on government property	Concessional loans to pay tax arrears	Interest-free liquidity loans
Loan guarantee schemes	Suspension of late payment of fees	Suspended penalties on payment of social tax	Reduction of social insurance tax rate	Compensating transport expenses in foreign trade
Relaxed public budget rules	Tax holidays and lifting of fines	Sole entrepreneurs exempted from all taxes	Trade loans in export-import operations	Preventing quality deterioration of loan portfolio
Lump sum social benefit payments	Preferential loans and subsidies	Preferentially loanable funds	Preferential loans	Reduced minimum social tax payment
Preferential loans to private entrepreneurs	Exemptions of property and land taxes	Priority in government procurement	Loan repayment deferrals	Deferral for payment of property and utility taxes
Financial assistance to create jobs	Discounts on state-owned property and utility bills			Suspended tax audits of businesses
Tax measures for stabilizing economy	Loan repayment at precrisis exchange rate			Deferral for payment of debt
	Subsidized credit to banks for soft loans			
	Reduced social contributions			
	Extended deadline to submit tax declarations and suspended audits			
	No sanctions and penalties on tax obligations			
	Extended deadline to submit tax report and social contributions			
	Extended deadline to submit a single tax return			
	Portfolio partial credit guarantee			
	Lump-sum contribution to meet operational expenses			
	Temporary ban on bankruptcy procedures			

Source: Compiled by the author.

affected SMEs on state-owned property leasing and utility bills, reduced social contributions, extended the deadline to submit tax declarations, suspended audits of all SMEs, eliminated tax sanctions and penalties for untimely fulfillment of tax obligations, and extended deadlines for submission of tax reports and social contributions (AIIB 2020a; ICC 2020).

Tajikistan's government has announced various measures to support SMEs for a specific period. The measures include tax breaks, suspension of accrual of surcharges for late payment of taxes, exemption from paying rent on public property, suspension of tax penalties on timely payment of social tax, and tax exemption for sole entrepreneurs in certain business categories. The Entrepreneurship Support Fund has allocated preferentially loanable funds to SMEs in food and medical supplies including women entrepreneurs. Government procurement of goods and services have been prioritized to domestic manufacturers for the crisis period (ADB 2020b; IMF 2020c; Vinokurov, Lavrova, and Petrenko 2020). Turkmenistan's government has announced various policy measures to support SMEs and protect jobs to mitigate the impact of the pandemic for a specific period. The measures include concessional loans for industrial manufacturing, promotion of export and import substitution; digital solutions for providing public services to businesses in line with the "single window" concept; expansion of regional support business centers to provide corporate governance and institutional capacity; concessional loans to SMEs in transport, tourism, hospitality, and oil and gas production to pay tax arrears; reduction in the social insurance tax rate; trade loans in export-import operations; preferential loans to existing and new SMEs; working capital support at lower interest rates to enterprises engaged in production of import-substituting and export-oriented products; preferential loans to construction companies; loan repayment deferrals; and preferential lending (OECD 2020c, 2020d; UN 2020).

Uzbekistan's government has announced different measures to support SMEs through its Anti-Crisis Fund during a specific period. The State Fund for the Support of Entrepreneurship has extended provision of guarantees and compensations to cover interest expenses primarily for loans issued to SMEs. The government has also implemented additional infrastructural projects to increase employment in SMEs, interest-free liquidity loans for repaying debts and covering essential spending, partially compensating transportation expenses of SMEs in foreign trade, and improving the quality of the loan portfolio (ADB 2020c; IMF 2020d). Other measures to support SMEs include reduction in the minimum social tax payment for sole entrepreneurs; interest-free deferral for payment of property, land, and water tax; suspension of tax

audits; and deferral for payment of debt without accrual of penalty for hospitality, tourism, logistics, and other businesses (ADB 2020a, 2020c).

Thus, it is evident that the Central Asian governments have implemented numerous policy measures to support SMEs. However, it is unclear whether these schemes have reached many self-employed people and informal SMEs as such enterprises' have low creditworthiness and limited access to formal credit. Informal SMEs and self-employed people often work in a grey area between the formal and the informal sectors. In the Central Asian countries, existing training and skills development programs for SMEs need to be strengthened, in addition to new initiatives to enable SMEs to maintain access to skills during the crisis and also to develop further skills as a part of the structural policy response to the crisis, for which governments can provide a wage subsidy to retain their apprentices and trainees for a specific period. Strategies can also be evolved for free access to online training platforms in technical know-how and management lessons for SMEs. Start-ups, women-owned enterprises, self-employed people, and informal SMEs should also be generously supported to access government liquidity programs through dedicated measures (Bartik et al. 2020; Eggers 2020; Kraus et al. 2020; Kuckertz et al. 2020; Robinson and Kengatharan 2020).

Besides the Central Asian economies, Pakistan, one of the CAREC member countries, also responded quickly to curb the economic impact of COVID-19. Box 5.1 briefly describes the policy responses by Pakistan's central bank (State Bank of Pakistan) to address the economic challenges of COVID-19. These policy responses include monetary easing, facilitating new investment, macro-prudential policy measures, loan extension and restructuring, wages and salaries support to the private sector, support to the health sector, promoting digital payments, and strengthening Roshan Digital Accounts.

Box 5.1: Pakistan's Central Bank Policy Response to Curb the Economic Impact of COVID-19

The COVID-19 pandemic is primarily a health crisis, which, due to its high transmission rate, has also become a major economic crisis. Since the discovery of the first COVID-19 case in early January 2020, many countries have been grappling with the health and economic fallouts of the pandemic. Like many other countries, Pakistan also faced the difficult task of slowing the spread of the COVID-19 virus, while simultaneously avoiding a large-scale reduction in economic growth. During this crisis, the banking and financial system of Pakistan has played a pivotal part in mitigating its impact, by providing financial support to different sectors of the economy. This box aims to document the range of policy measures adopted by Pakistan's central bank (State Bank of Pakistan: SBP) to meet the challenges posed by COVID-19 (Summary of policy measures given in Annexure – I).

Monetary Easing
Around the time of the Sindh provincial government's announcement of the first 2-week lockdown in Pakistan from 24 March 2020, SBP took different policy measures to mitigate COVID-19's economic impact. On 17 March 2020, SBP announced a reduction in the policy rate by 75 basis points from 13.25% to 12.5%. Anticipating further spread of COVID-19 cases and longer-term lockdowns, SBP further reduced the policy rate by 150 basis points to 11% on 24 March 2020. Further rate cuts of 200, 100, and another 100 basis points, respectively, were announced in April, May, and June 2020. In aggregate, in a span of 3 months, SBP reduced the policy rate by 625 basis points. The policy rate remained at 7% for about 15 months from 25 June 2020 to 20 September 2021. SBP in its monetary policy statement of 22 January 2021 stated that, "In the absence of unforeseen developments, the MPC expects monetary policy settings to remain unchanged in the near term." SBP considered the policy rate of 7% to be conducive for growth during the more stringent phase of COVID-19 lockdowns.

Facilitating New Investment
SBP launched the Temporary Economic Refinance Facility,[1] which is a concessionary finance facility aimed at boosting new investment, expanding existing projects, and supporting Balancing, Modernization, and Replacement efforts of the industrial sector. Banks/direct financial institutions can provide financing to all sectors under this facility except the power sector, where SBP is already providing financing through another facility. The maximum loan allowed is PRe5 billion ($32.8 million[2]) per project, with end-user mark-up

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[1]   https://www.sbp.org.pk/smefd/circulars/2020/C1.htm
[2]   The US dollar–Pakistan rupee exchange rate quoted here is the buying-side weighted daily average rate as of 31 March 2021. The same rate is used wherever exchange rate conversions are quoted (source: https://www.sbp.org.pk/ecodata/Rates/WAR/WAR-History.asp).

Box 5.1 *continued*

rate of 5% per annum. The tenor of the loan is 10 years, with a grace period of 2 years. As of 31 March 2021, PRe435.7 billion ($2.86 billion) worth of financing has been approved under the Temporary Economic Refinance Facility scheme.

Macro-prudential Policy Measures

The central bank also announced certain relaxations in the form of Basel Capital Adequacy measures3 such as 1% reduction in the Capital Conservation Buffer (CCB)4 from 2.5% to 1.5% and enhancement of regulatory limit of retail portfolio from PRe125 million ($0.8 million) to PRe180 million ($1.2 million). The reduction in CCB would create space for banks to disburse an additional estimated PRe800 billion ($5.25 billion), which is around 10% of their outstanding loans in March 2020. The enhancement of retail portfolio limits would allow banks to increase funding to small and medium-sized enterprises from PRe125 million ($0.8 million) to PRe180 million ($1.2 million).

Loan Extension and Restructuring Package

In order to provide further relief to borrowers, SBP introduced a scheme that allowed bank borrowers up to a 1-year cushion to pay back principal on their loans;5 however, the borrowers will continue to pay a mark-up on the loan. Moreover, borrowers who could not do so, or needed a deferment on principal repayment of over 1 year, could request a rescheduling/restructuring of the loan. The credit history of the borrower will not be affected adversely under this scheme whether it is availed for deferment of principal repayment or restructuring of loans. As of 9 April 2021, PRe657 billion ($4.31 billion) worth of loans have had their principal amount deferred, while loans worth PRe253 billion ($1.66 billion) have been restructured under this scheme.

Furthermore, due to volatility on the Pakistan Stock Market at the start of COVID-19 lockdowns, SBP provided relief in the margin requirement (from 30% to 20%) and margin calls (from 30% to 10%) for exposure against shares of listed companies. The criteria for classification of Trade Bills were also relaxed by 3 months.

SBP Rozgar (Employment) Scheme

SBP also announced a refinancing scheme6 to prevent layoffs of private-sector workers whereby firms could borrow funds from banks to provide wages and salaries. The scheme was open from April 2020 to September 2020 and firms could borrow funds to pay employees under different contracts

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3   https://www.sbp.org.pk/bprd/2020/CL12.htm
4   CCB is a regulatory framework that requires banks to build up buffer capital in good/normal times, which can be used as losses are incurred during stressed periods. CCB strengthens the ability of banks to withstand adverse economic environments. Implementation of the CCB framework increases banking sector resilience going into a downturn, and provides the mechanism for rebuilding capital during the early stages of economic recovery.
5   https://www.sbp.org.pk/bprd/2020/CL13.htm
6   https://www.sbp.org.pk/smefd/circulars/2020/C6.htm

Box 5.1 *continued*

such as permanent employees, contractual employees, and daily wagers, as well as outsourced personnel. As of 13 November 2020, loans amounting to PRe238 billion ($1.56 billion) have been approved under this scheme.

Supporting the Health Sector

The COVID-19 crisis resulted in significant pressure on the healthcare system and hospitals. In order to provide financial support to the healthcare system during this crisis, SBP initiated a scheme to discount funds to hospitals through the Refinance Facility for Combating COVID-19.[7] Under this scheme, SBP provided refinancing to banks to lend up to PRe500 million ($3.3 million) at a maximum interest rate of 3% for 5 years for COVID-19-related purchases. Healthcare facilities may also avail up to 100% of the financing under this scheme to set up isolation wards. As of 8 April 2021, loans worth PRe12 billion ($78.7 million) have been approved under this scheme.

Promoting Digital Payments

In order to facilitate social distancing during COVID-19 and to encourage people to stay at home during lockdowns, SBP waived bank charges for online fund transfers for all banks.[8] Furthermore, SBP introduced the Direct Cheque Deposit Facility, which allowed customers to use the SBP-operated Real-Time Gross Settlement system to conduct their transactions.[9]

Roshan Digital Accounts

The Roshan Digital Account was an SBP initiative to provide innovative banking solutions for overseas Pakistanis seeking to undertake banking, payment, and investment activities in Pakistan. Although this initiative was not started at the onset of COVID-19 and may not have been a direct policy response, it has helped in increasing Pakistan's foreign exchange reserves. Pakistan has a very large number of overseas workers in the Middle East and Gulf countries and a considerable diaspora in North America and the United Kingdom. Pakistani workers in the Middle East and Gulf have historically sent large amounts of remittances to their families, which has helped boost the country's foreign exchange reserves. However, they had limited options to direct their remittances toward investment activities. Similarly, the Pakistani diaspora in North America and the United Kingdom found it very cumbersome to send remittances and to direct investments toward Pakistan.

The Roshan Digital Account was launched in September 2020; since then, overseas Pakistanis have remitted a record $500 million through February 2021.[10] The Roshan Digital Account has allowed overseas Pakistanis to remit foreign exchange to Pakistan and is opening avenues for increased capital flows in investment in Pakistan's stock market and government bonds.

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[7]   https://www.sbp.org.pk/smefd/circulars/2020/C3.htm
[8]   https://www.sbp.org.pk/psd/2020/C2.htm
[9]   https://www.sbp.org.pk/psd/2020/C4.htm
[10] https://www.sbp.org.pk/press/2021/Pr-18-Feb-21.pdf

Box 5.1 *continued*

Summary of Pakistan's Central Bank Policy Response to Curb the Economic Impact of COVID-19

	Policy Measure Against COVID-19	Detail of Policy Measure	Policy Performance
1	Monetary Easing	Reduction of policy rate from 13.25% in March 2020 to 7% in June 2020	Reduction in policy rate helped boost aggregate demand in the economy in the wake of COVID-19 lockdowns.
2	Temporary Economic Refinance Facility (TERF)	Concessional finance facility aimed at boosting new investment, expansion of existing projects and Balancing, Modernization and Replacement (BMR)	As of 31 March 2021, the TERF scheme has matured and PRe435.7 billion ($2.86 billion) worth of loans have been approved under TERF till that date.
3	Macro-prudential policy measures	1% reduction in Capital Conservation Buffer (CCB) from 2.5% to 1.5% and enhancement of regulatory limit of retail portfolio from PKR125 million to PKR180 million	The reduction in CCB would create space for enable banks to disburse an additional estimated amount of PRe800 billion ($5.25 billion), which is around 10% of their outstanding loans in March 2020.
4	Loan Extension and Restructuring Package	Bank borrowers allowed up to a 1-year cushion to pay back principal on their loans; however, the borrowers will continue to pay mark-up on the loan. Moreover, borrowers who could not pay mark-up on their loans or needed a deferment on principal repayment of over 1 year, could request rescheduling/restructuring of the loan. Credit history of the borrower will not be affected adversely under this scheme whether it is availed for deferment of principal repayment or restructuring of loans. SBP provided relief in the margin requirement (from 30% to 20%) and margin calls (from 30% to 10%) for exposure against shares of listed companies. The criteria for classification of Trade Bills has also been relaxed by 3 months.	As of 9 April 2021, PRe657 billion ($4.31 billion) worth of loans have their principal amount deferred while loans worth PRe253 billion ($1.66 billion) have been restructured under the TERF.

Box 5.1 *continued*

	Policy Measure Against COVID-19	Detail of Policy Measure	Policy Performance
5	SBP Rozgar (Employment) Scheme	SBP announced a refinancing scheme to prevent layoff of private-sector workers whereby firms could borrow funds from banks to provide wages and salaries to their employees. The scheme was open for 6 months from April–September 2020 and firms could borrow funds to provide salaries to employees under different employment contracts such as permanent employees, contractual, daily wagers, as well as outsourced personnel.	As of 13 November 2020, loans amounting to PRe238 billion ($1.56 billion) have been approved for wages and salary under this scheme.
6	Supporting the Health Sector	In order to support hospitals and healthcare system during COVID-19, the central bank initiated a scheme to provide discounted funds to hospitals through "Refinance Facility for Combating COVID-19"	As of 8 April 2021, loans worth PRe12 billion ($78.7 million) have been approved under "Refinance Facility for Combating COVID-19"
7	Promoting Digital Payments	In order to facilitate social distancing during COVID-19 and to encourage people to stay at home during COVID-19 lockdowns, SBP waived bank charges for online fund transfers for all banks. Furthermore, SBP introduced the Direct Cheque Deposit Facility which allowed customers to use SBP operated Real-Time Gross Settlement (RTGS) system to conduct their transactions.	Waiving off bank charges for online fund transfers faciliated digital transactions, which was pivotal for conducting socially-distanced bank transactions during COVID-19 lockdowns. Furthermore, the Direct Cheque Deposit Facility helped customers conduct transactions in real-time.
8	Roshan Digital Accounts (RDA)	The Roshan Digital Accounts (RDA) was an initiative of SBP to provide innovative banking solutions for overseas Pakistanis seeking to undertake banking, payment and investment activities in Pakistan.	Overseas Pakistanis have remitted $500 million in 5 months from September 2020 to February 2021.

Source: This box was prepared by Muhammad Moaiz Siddiqui, Deputy Director, Systemic Risk Monitoring Division, Financial Stability Department, State Bank of Pakistan.

5.5 Conclusion and Policy Implications

In the Central Asian countries, SMEs have suffered immensely from the impact of the COVID-19 pandemic. SMEs in Central Asia have faced similar supply and demand shocks, including lower sales and revenue, liquidity constraints, workforce retrenchment, and business closures (Bartik et al. 2020). Many SMEs have used retreating coping strategies (Tsilika et al. 2020), which caused liquidity crunches and bankruptcy. Resilient and agile strategies have been used by a few SMEs. Kazakhstan, the Kyrgyz Republic, Tajikistan, and Uzbekistan have incurred substantial economic losses and implemented various anti-crisis measures, while Turkmenistan responded slowly (IMF 2020e). Governments have implemented varied policies to mitigate the negative effects of the pandemic-induced restrictions on SMEs including fiscal, monetary, and financial measures. Country-specific approaches have been based on labor markets and social security institutions. All of the Central Asian countries have developed and implemented measures to support SMEs. These measures include tax holidays, lifting of fines, preferential loans, and subsidies. The most commonly used instruments to support SMEs in the Central Asian countries include tax deferrals, loan guarantees, direct lending, and wage subsidies. Grants, debt moratoriums, and other measures have differed greatly across countries. Debt finance via bank loans has also been used to support SMEs (CAREC Institute 2021). However, the use of structural policies has been modest across the regional economies.

SMEs will need extended governmental support (Pacces and Weimer 2020) to recover from the scourge of the pandemic. Like the policy support throughout the containment period, SMEs will require extended financial support in the form of salary subsidies, tax deferrals, and access to loans and credit, which should vary across countries depending on government support during the lockdown (CAREC Institute 2021; ITC 2020). Governments should provide salary subsidies to the worst-affected SMEs by evolving robust financial support mechanisms to enable these enterprises to reemploy their laid off workers, which will increase employment and help generate new demand. SMEs with an outstanding loan or line of credit from a financial institution should be allowed loan repayment deferrals for an extended period until reaching normal business operations and recovery. The access to new loans and credit guarantees to SMEs should also be given top priority by financial institutions to help these enterprises recover from the pandemic shocks. Fintech firms can promote the financial inclusion of SMEs better than traditional financial institutions can (Genberg 2020) through application

of digital technology (Huang 2020). Robust SME development through greater financial access can contribute significantly to job creation, economic diversification, and growth in Central Asian economies (Morgan, Nurgaliyeva, and Kydyrbayev 2021).

Regional cooperation in improvement of transportation infrastructure can be highly beneficial for agro- and-horticulture-based SMEs in Central Asian economies (Kapparov 2021). However, inadequate financial awareness and low regulatory compliance of SMEs hamper their profitability and value chains (Mirzoev and Sobirzoda 2021). Therefore, the robust financial inclusion strategies of the Kyrgyz Republic should be replicated in other Central Asian economies by developing and implementing coherent country-level policies for SMEs' development. Besides, SMEs should also be provided rental deferrals in public properties and rental subsidies in private properties, sufficient utility subsidies, and social security exemptions for an extended period until optimal business recovery. However, these support measures can be extended for the short term and are highly unsustainable over the long term.

The pandemic-induced restrictions are being gradually lifted across the Central Asian countries. The economic impact of the pandemic will likely remain in the near future. The lingering impact will surely affect ongoing economic reforms and calls for robust economic governance covering all sectors including SMEs. Aside from the severe economic disruption, the pandemic crisis also provides an opportunity to the Central Asian countries for undertaking robust economic reforms. Deeper analysis of the pandemic's impact on SMEs and the informal sector is valuable desirable to help countries formulate their sustainable recovery plans, which should be based on proper needs assessment, robust statistics, inclusive targeting, improved financing and infrastructure, diversified and better digital connectivity, and skill development. Besides, governments should provide direct income support to severely affected sections of the population to increase demand and indirectly support the revival of SMEs (CAREC Institute 2021).

SMEs and policymakers are shifting their focus to the post-pandemic "new normal" economy (ITC 2020). Employment creation and/or retention should be considered as an additional criterion for government support to SMEs. Governments should embrace a holistic education approach by integrating all relevant stakeholders to address the future market needs. The COVID-19 pandemic has shown how new jobs may evolve and the types of skills needed in the future (ILO 2020c). Governments should leverage new educational opportunities for future job readiness and economic revival (ILO 2020d). Smooth transitions

from education to industry should be facilitated by preparing industry-ready graduates. Technical and vocational education, and training systems and universities are vital in this effort. Governments should provide necessary funding to support industrial players to enhance on-the-job training in critical skills needed by industries. Regional cooperation is essential to foster a regional talent mobility plan aligned with a future-ready workforce for SMEs' development in Central Asia.

SMEs have significant experience to operate in domestic markets due to sound knowledge, local partners' support, and a strong ability to thwart obstacles and succeed (ILO 2020a). However, acquired local business skills often do not apply to distinct regional markets. Therefore, localized capability-building of SMEs should be bolstered allow them to better understand regional differences in local markets, distinct business environment, and diverse institutional regimes, and to reorient the business models by embracing a regional strategy specific to Central Asia. Upskilling is a challenging task for SMEs with large numbers of workers, lower digital and trade readiness, inadequate finance, and managerial deficiency (Yoshino and Taghizadeh-Hesary 2016). Besides government-sponsored training support, public–private collaboration should be bolstered for SME reskilling. Governments should also leverage SMEs partnerships with large companies to gain from their networks and expertise in upskilling. This can be a win-win situation for both SMEs and large firms. SMEs can integrate smoothly with regional supply chains of large companies with lower costs and reduced supply chain vulnerability to shocks, and large firms can tap SMEs as their suppliers with greater market access and lower costs.

The pandemic crisis and global trade conflicts have increased business uncertainties, manufacturing costs, regulatory costs, and supply chain risks, which call for more balanced, resilient, and agile supply chains to mitigate associated risks by developing regional product supply networks for greater visibility during potential disruptions (Park et al. 2020). Regional economies should embrace shared responsibilities in constructing a shared future for SMEs implementing novel product supply chain solutions to address the pandemic crisis and post-pandemic economic recovery. Supply chain resilience and agility should be driven by moving away from GVCs to regional value chains (RVCs) to reduce supply chain vulnerabilities by strengthening regional networks, which require compatible business strategies, innovation ecosystems, and upskilling of workers (Cornell University, INSEAD, and WIPO 2020). Government support is imperative to develop robust regional product supply networks for increased access to funds, local expertise, and competitive and mutual gains through better infrastructure and enabling policy for collective action (Morgan, Nurgaliyeva, and

Kydyrbayev 2021). The national governments should provide enabling regulations to increase cross-border trade and reduce transaction costs through strong regional cooperation and policy coordination (PwC 2020a). Governments should also provide all necessary enabling policy support to SMEs for improved access to credit (Morgan, Nurgaliyeva, and Kydyrbayev 2021) and new technologies (Genberg 2020). Regional market expansion requires upskilling in virtual meeting skills for future growth. Upskilling in trade readiness should be built to enter and compete in regional markets. Strong cross-border trade should be facilitated by regional upskilling strategies to address operational challenges, localized innovation, and market expansion through an incessant agility (WTO 2019). Besides upskilling, capabilities of SMEs should be enhanced to pursue cross-border collaborations with supply chain partners for shared growth and prosperity (Morgan, Nurgaliyeva, and Kydyrbayev 2021).

Application of new technologies has immense future potential to increase the digitalized services trade in education, health care, entertainment, construction, finance, transport, and travel for more inclusive growth and shared economic prosperity with small investments compared to the manufacturing trade of SMEs in Central Asian economies (Park et al. 2020). For instance, demand for health care and educational services has increased immensely in all domestic economies during the pandemic and is likely to surge in the future. Therefore, there is greater scope for regional cooperation in services trade to tap emerging opportunities through shared information, standards, and technical assistance, and through policy targets for reducing operational costs and easing entry barriers (OECD 2021). SMEs' digital value chains should be improved and strengthened diligently to unleash the new technologies for greater resilience and agility to respond to regional market needs (PwC 2020a). More established SMEs should pursue the digitalization of RVCs and business resilience and agility to cope with the crises and disruption risks (ITC 2020). However, skills gaps in digital and new technologies remain substantial in Central Asia. Therefore, the skills needed to tap the emerging digitalization opportunities should be the regional priority for upskilling workers and reskilling the SME sector to leverage localized strategies and to remain agile and viable in overseas markets (AIIB 2020b). An integrated reskilling strategy should be developed and implemented to address the needs of all relevant stakeholders in the region to enable SMEs to move up the digital value chains. The upskilling training plan should build the capability of workers in technical and digital skills, including social and emotional skills aligned with the regional growth strategy. The national governments should provide enabling policy support to

bolster SMEs' digital adoption through regional upskilling initiatives in application of novel technologies and an enabling policy environment for agile innovation, digital readiness, digital trust, and lower cyber risks (PwC 2020b). However, most cyber risks are cross-border transactions. Therefore, addressing cross-border digital threats requires regional coordination of cyber laws and data privacy for increased cyberresilience (Hedrich, Wong, and Yeo 2020).

In brief, SMEs are the cornerstone of future growth for Central Asia. SMEs should move forward from being profit- and operations-oriented to using more risk-conscious and resilient business models by implementing more resilient and agile strategies to tap the market dynamics through novel RVCs (Kuckertz et al. 2020). SMEs should adopt agile risk management structures based on sound data and stronger cybersecurity to increase digital and supply chain resilience through tactical decision making (CAREC Institute 2021). Regional economic cooperation and integration have immense potential to drive SMEs' development in Central Asia through stronger RVCs in the new normal economy with reduced vulnerability to future disruptions (ADB 2021; Morgan, Nurgaliyeva, and Kydyrbayev 2021). Therefore, novel policy prescriptions to address the pandemic-induced crisis and post-pandemic economic recovery should target the untapped regional markets, upskilling, digital innovations, and best SME practices (Maritz et al. 2020). Restrictive regulatory barriers affecting SMEs' performance, cross-border trade, and digitalization should be removed to enable them to expand their markets across Central Asia through regional cooperation for speedier post-COVID-19 recovery, economic stability, and shared prosperity.

5.6 Contributions, Limitations, and Future Research Agenda

The management of SMEs should rebuild their formal and informal business organizations to mitigate the impact of future crises like COVID-19. SMEs should embrace digital technologies for sustainable production, distribution, and marketing. Digital financial management is imperative to maintain sustainable liquidity, which necessitates governments' support to build the dynamic capabilities of SMEs. The use of meta-type methodology, qualitative research, and content analysis through data and information triangulation has its limits. Future research should apply more scientific quantitative methodology to collect primary data and analysis for greater validity and more robust findings. Detailed empirical research is needed to analyze the effectiveness of the

coping strategies adopted by SMEs and governments' policy responses through deeper quantitative analysis of the beneficiaries. Research is also required to analyze the impact of government policy responses on business operations and agility and resilience of the SMEs to tackle the crisis in the long run. Extant studies on long-term mitigation strategies for survival of SMEs are scant. The longer period of government-induced restrictions to contain the pandemic's spread have neutralized the impact of coping strategies on the long-term performance of SMEs and needs further research. Further research is needed to scientifically understand the recovery trends of SMEs and analyze how small businesses across the Central Asian countries recover from the COVID-19 pandemic as countries ease containment measures, which will surely provide deeper insights for policymakers to mitigate the impact of future crises like the COVID-19 pandemic. Limited research is available to analyze the impact of external support on SMEs' performance and survival; this also needs further study. SMEs closed due to the pandemic impact are not well researched. This presents potential research opportunities to analyze how some SMEs that closed due to the pandemic later reemerged with new ventures and successfully countered the crisis using tactical strategies. The analysis of the pandemic's impact so far on SMEs is extensive, and the pandemic is still evolving with the emergence of new variants. How this evolution will impact SMEs is yet to be researched.

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6

What Determines the Adaptation of Enterprises to COVID-19 in CAREC Member Countries? Empirical Evidence from Azerbaijan, Georgia, Kazakhstan, and Mongolia

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6.1 Introduction

The sudden coronavirus disease (COVID-19) outbreak has affected economic activity worldwide and has been characterized by significant uncertainty regarding its duration and magnitude (Didier et al. 2021). Unlike previous global crises, COVID-19 challenged economies with both supply and demand shocks, as shown in Figures 6.1–6.3 (Borino et al. 2021; Juergensen et al. 2020; Kuriakose and Tran 2020). There has been a decline in demand as a result of lockdown measure (Figure 6.4), and firms also faced disruption in transportation and labor shortages on the supply side due to stay-at-home orders (Borino et al. 2021; Juergensen et al. 2020). Because the pandemic is ongoing, empirical data are scarce, with almost no data regarding how COVID-19 has affected entrepreneurs in Central Asia Regional Economic Cooperation Program (CAREC) economies.

   This study fills this gap by using the World Bank's COVID-19 Follow-Up Enterprise Survey for four CAREC economies: Azerbaijan, Georgia, Kazakhstan, and Mongolia. This survey, which was conducted

in two rounds for Georgia and Mongolia during 2020 and 2021 and one round in Azerbaijan and Kazakhstan in 2021, allowing us to analyze the challenges and issues, as well as their extent for firms across countries. The main objective of this study was to empirically investigate COVID-19's effect on firms' production ability. Potential factors include managerial and firm characteristics, as well as the institutional settings in which these enterprises operate, including in terms of government regulations and other potential barriers to operation.

COVID-19 dramatically changed economic growth dynamics in 2020, with GDP growth in Azerbaijan, Georgia, Kazakhstan, and Mongolia falling by 4%, on average (see Figure 6.5). According to the IMF policy tracker, Azerbaijan has been negatively impacted by COVID-19 due to a rapid fall in oil prices. To mitigate the adverse effects of the pandemic, Azerbaijan implemented fiscal support of AZN3.3 billion or 4.85% of GDP (IMF 2021). Georgia, meanwhile, has provided GEL1.86 billion in funding to individuals and industries, or 3.8% of GDP in 2020. In Kazakhstan, fiscal support that targeted the most-affected economic sectors and small and medium-sized enterprises (SMEs), mitigated the adverse impact of the pandemic. Mongolia implemented measures involving MNT3 billion in support to the regions most affected by the crisis.

Figure 6.1: COVID-19 Cases (daily net change)

Source: Bloomberg (2021).
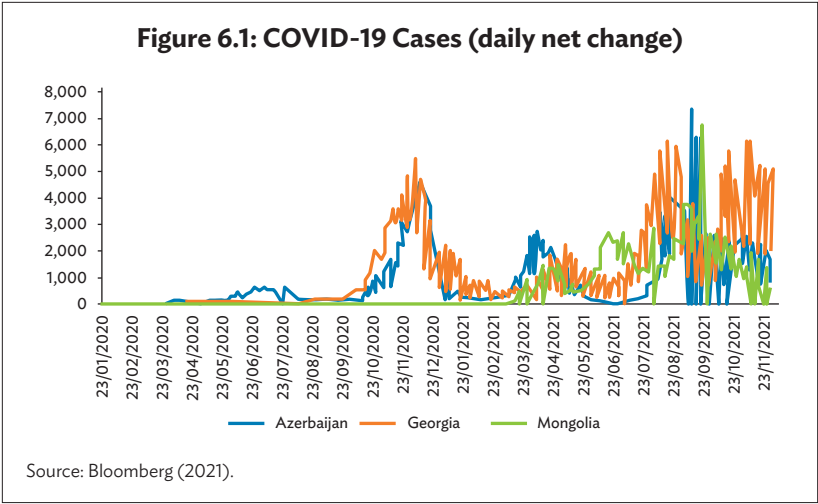
Figure 6.2: COVID-19 Deaths (daily net change)
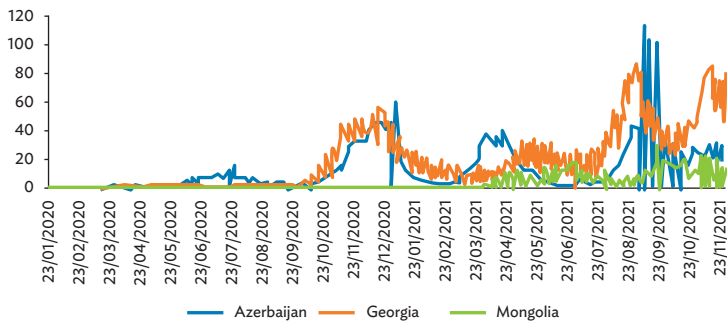
Source: Bloomberg (2021).

Figure 6.3: COVID-19 Vaccinations (daily net change)

Source: Bloomberg (2021).

Figure 6.4: Stringency Index

Note: The stringency index is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans. It varies from 0 to 100 (100 = strictest).

Source: Our World in Data and Hale et al. (2020).

Figure 6.5: Gross Domestic Product Real Growth Rates

Source: World Bank (2021b).
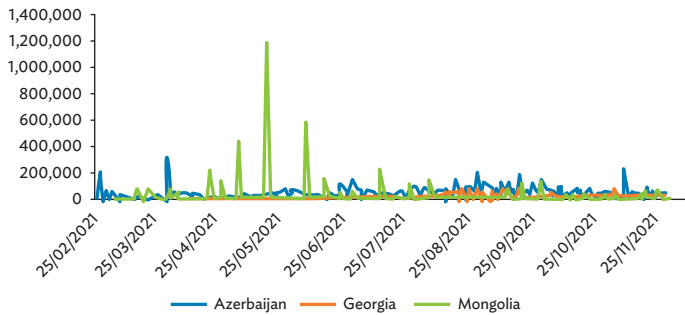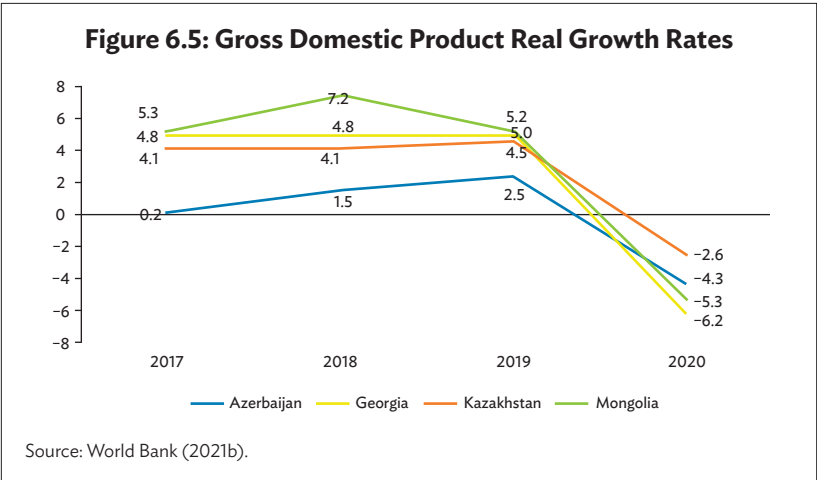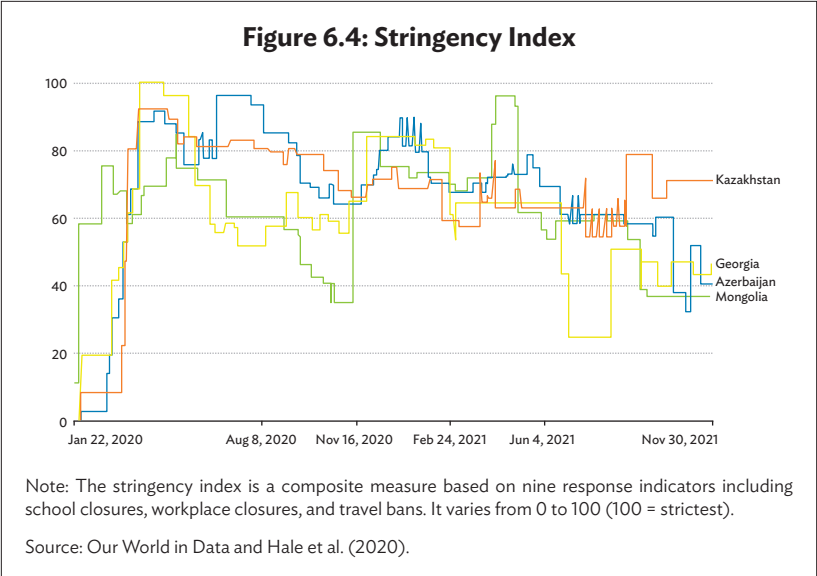
COVID-19 has had a significant impact by affecting firms and industries and shrinking production across countries. However, there is no empirical evidence about the extent to which policy measures and other factors have protected enterprises in CAREC economies.

6.2 Literature Review

The empirical literature suggests that SMEs are more flexible and adaptable than larger firms because of their small size, private ownership, and flat hierarchical structures (Bartik et al. 2020; Juergensen et al. 2020). This adaptive capability is vital to resisting economic crises (Durst and Henschel 2021).

During a crisis, firms face declines in sales, reduced access to financing, and uncertainties (Apedo-Amah et al. 2020). One of the first short-term impacts of COVID-19 was financial concerns, particularly regarding liquidity, with smaller firms facing disproportionately greater constraints (Apedo-Amah et al. 2020; Juergensen et al. 2020). However, the impact of COVID-19 could be heterogenous, so both micro and large firms could be more likely than SMEs to face solvency issues (Guerini et al. 2020). The supply chain, labor supply, and final demand for goods and services are more vulnerable to negative shocks for smaller firms than for larger firms (Sonobe 2021). Firms with higher total asset values and a longer cash flow coverage period face significantly lower risks, because they help mitigate the effects of a crisis such as COVID-19 (Abu Hatab, Lagerkvist, and Esmat 2021).

COVID-19 has had a heterogeneous impact on economic sectors and regions as well. During the pandemic, the most vulnerable sectors were hotels and restaurants, household services, and construction, while manufacturing and wholesale trade were more resilient (Guerini et al. 2020). Empirical studies have shown that COVID-19 caused a virtual shutdown of the tourism sector, and stakeholders and workers shifted to other economic sectors to look for alternative occupations (Kristiana, Pramono, and Brian 2021).

International firms are more vulnerable to market shocks than domestic firms (Borino et al. 2021). International firms were, however, more resilient and adaptable to COVID-19 than their counterparts, and were less likely to close (Borino et al. 2021; Bachas, Brockmeyer, and Semelet 2020). During the pandemic, firms rapidly adopted digital technologies to solve issues related to supply chain management and production (Kuriakose and Tran 2020), which led to tentative digitalization (Kraus et al. 2020). Empirical analysis has shown that SMEs adopted different digital transformation paths, such as accelerating the transition toward firm digitalization, digitalization of sales only, or finding partners that had required digital capabilities (Priyono, Moin, and Putri 2020). The startups, innovators, and firms that relied on internal sources of knowledge had a greater ability to adapt to COVID-19 than non-innovators, while there was no difference

between the adaptability of firms led by men versus women (Krammer 2021).

The results of a survey conducted by the Asian Development Bank Institute (ADBI) in eight developing economies in South, Southeast, and Northeast Asia suggest that online sales will increase among many micro, small, and medium-sized enterprises (MSMEs), especially those in hard-hit sectors and particularly manufacturing firms, younger firms, export-oriented firms, those that have already experienced online sales, firms experiencing a cash shortage, and firms that did not have to reduce their employment numbers. Many firms thus appear to have found it profitable to increase their online sales (Sonobe et al. 2021). Another MSME survey conducted by ADBI from the end of March to mid-April 2020 found that the impact of COVID-19 varied by firm size and sector. Given the different abilities of MSMEs to adjust by firm size and sector, the government could provide more targeted policy measures (Shinozaki and Rao 2021).

Some studies have indicated that SMEs and individual enterprises may demonstrate a more dynamic tendency toward innovation compared to large firms (Love and Roper 2015), but this may depend on factors ranging from the firm's leaders to access to financial resources, and financial constraints were found to be an important element (Skuras et al. 2008; Landesmann et al. 2016). Other studies asserted that non-financial support to increase labor productivity is important for innovation and, hence, for long-term sustainability (Szczepanska-Woszczyna 2014). Qualified labor can also be considered an important challenge for enterprises within the developing country context (Norek and Arenhardt 2015). In general, it can be assumed that firms' innovativeness and ability to take new forms in response to COVID-19 correlate with their adaptability to new economic conditions. Interestingly, Karymshakov et al. (2019) have shown that the experience of managers has a curvilinear effect on SME innovation, which may imply that this factor is important for firms' adaptability to COVID-19 as well. However, there is scarce empirical evidence on the adaptability of enterprises to changing social and economic dynamics in the context of Central Asian economies.

6.3 Data

Our dataset was constructed by merging basic firm characteristic data from a World Bank (2021) standard Enterprise Survey (baseline) before the COVID-19 period (i.e., 2018–2020), and two follow-up waves that were conducted in 2020 and 2021 using the sample of firms from the

baseline survey. The baseline survey's focus was on sales, production, labor, finance, and government, while the follow-up surveys covered questions related to the COVID-19 crisis. The availability of follow-up survey data for CAREC countries included only Azerbaijan, Georgia, Kazakhstan, and Mongolia. Sample distribution by survey year, wave, and sector of both baseline and follow-up surveys by country are presented in Table 6.1 and Figure 6.6.

Most firms in the sample are SMEs (80%), while large firms are 14% and micro, 6% (Figure 6.7).

Table 6.1: Sample Distribution

Country	Year of Baseline Survey	Follow-up Survey		Total
		Wave I	Wave II	
Azerbaijan	2019, 2020	105 (Apr, May 2021)		105
Georgia	2019, 2020	614 (Jun 2020)	589 (Oct, Nov 2020)	1,203
Kazakhstan	2019	871 (Jan–Mar 2021)		871
Mongolia	2018, 2019	314 (Aug 2020)	323 (Feb 2021)	637
Total		**1,904**	**912**	**2,816**

By sector					
Industry	Azerbaijan	Georgia	Kazakhstan	Mongolia	Total
Food	0	260	138	0	398
Retail	34	237	104	195	570
Manufacturing	31	257	222	210	720
Metal, machinery, and equip. mineral	0	0	223	0	223
Services	40	445	184	232	901
Total	**105**	**1,199**	**871**	**637**	**2,812**

Source: Authors' own calculations using World Bank data (2021a).

Figure 6.6: Sample Distribution Across Sectors
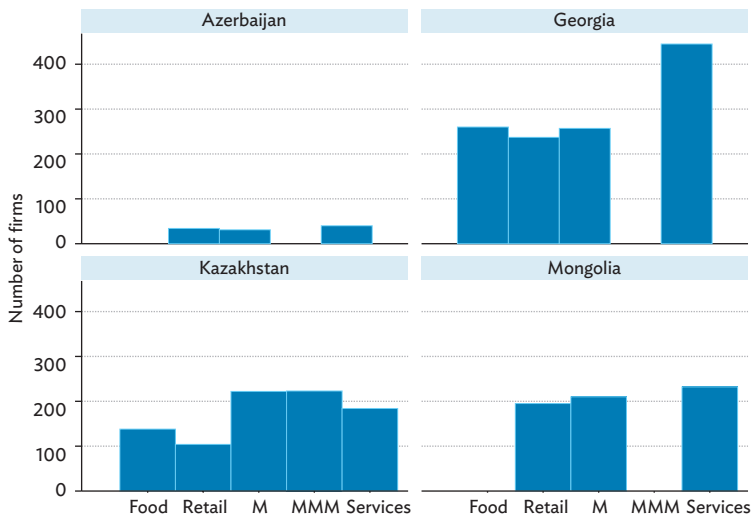
M = Manufacturing, MMM = metal, machinery, and equip. mineral.

Source: Authors' own calculations using Word Bank data (2021a).

Figure 6.7: Share of Firms by Firm Size
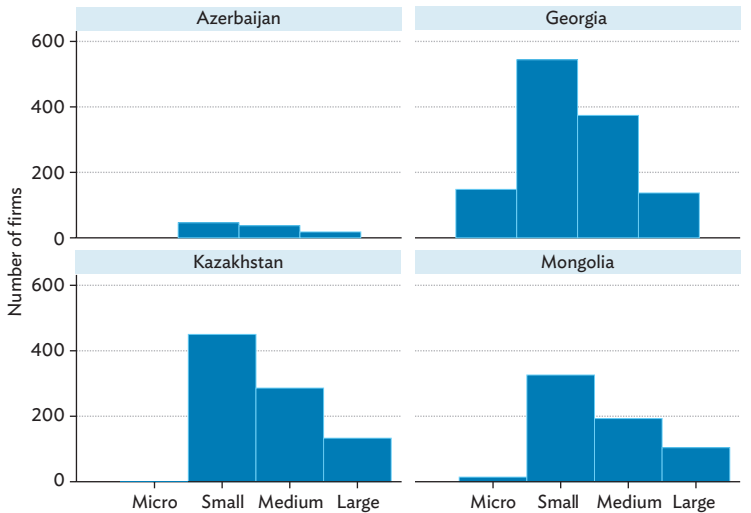
Source: Authors' own calculations using Word Bank data (2021a).

We use six samples in our estimations; the pooled dataset covers all available data for the four countries. The dataset includes two waves for Georgia, conducted in June and November 2020, and two waves for Mongolia, implemented in August 2020 and February 2021. Only one wave of the survey was conducted in Azerbaijan and Kazakhstan during the first half of 2021. Differences in survey periods for the follow-up waves do not allow us to measure the impact of COVID-19 on an equal basis. Therefore, along with the total sample, we use a differential approach in grouping the data. First, only those surveys conducted in 2020 and 2021 are used separately. Thus, the 2020 sample includes both waves for Georgia, and the first wave for Mongolia. The 2021 sample covers Azerbaijan, Kazakhstan, and the second wave covers Mongolia. In this case, the second wave of the survey in Georgia was in late-2020 and may incorporate evidence on the later effects of COVID-19 compared to the earlier period. We therefore use another sample from 2021 by including the second wave of the survey for Georgia. Data for Georgia and Mongolia include two waves, and they are used as first and second samples. As shown in Table 6.1, the total sample size is 2,816, with different variable availability for empirical analysis. In the estimation models, sample sizes range from 654 to 2,149.

Table 6.2: Descriptive Statistics

	Total Sample	2020	2021	2021(*)	Wave I: Mongolia and Georgia	Wave II: Mongolia and Georgia
Production Adaptability (1 = firm has adjusted or converted production)	0.37	0.29	0.46	0.41	0.29	0.44
Firm age (years since firm start operations)	14.03	13.31	14.87	13.94	14.20	14.41
Capital city	0.29	0.36	0.22	0.26	0.36	0.36
Share of direct export (as % of total sales)	3.24	4.25	1.95	3.96	1.84	5.99
Innovation in process (1 = firm has introduced new or improved process)	0.21	0.21	0.21	0.20	0.25	0.26
Use of website (1= firm has website)	0.51	0.50	0.53	0.53	0.48	0.49
Firm strategy (1= firm has formal strategy)	0.37	0.27	0.47	0.40	0.30	0.30
Experience of manager (years in a sector)	16.40	18.04	14.45	15.76	17.68	17.68
Gender of manager (1= female)	0.27	0.26	0.29	0.27	0.28	0.29

Table 6.2 *continued*

	Total Sample	2020	2021	2021(*)	Wave I: Mongolia and Georgia	Wave II: Mongolia and Georgia
Foreign ownership (as %)	5.16	7.10	2.87	4.38	6.73	5.98
Firm size (N)	2812	1,517	1,295	1,884	928	912
Micro	164	155	9	82	82	80
Small	1,366	704	662	928	438	432
Medium	890	471	419	603	287	280
Large	392	187	205	271	121	120
Sector (N)	2,812	1,513	1299	1886	926	910
Food	398	260	138	266	132	128
Retail	570	331	239	354	216	216
Manufacturing, Garments	720	360	360	486	234	233
Metal, Machinery, and Equip. Mineral	223	0	223	223	0	0
Services	901	562	339	557	344	333
Access to financing (1= firm had a loan)	0.41	0.49	0.32	0.37	0.48	0.50
Government support (1= firm had a loan)	0.31	0.37	0.23	0.28	0.35	0.39
Stringency index (impact of COVID-19) from 0 to 100 (100 = strictest)	60.06	56.79	63.89	61.68	56.77	58.23
Transport	1.87	1.88	1.84	1.85	1.89	1.91

Note: 2021(*) includes observations of surveys from 2021 and second wave for Georgia.
Source: Authors' own calculations using World Bank data (2021a); Hale et al. (2021).

The descriptive statistics given in Table 6.2 indicate that, for the total sample, fewer than half of all firms had introduced innovative processes before the crisis, and were recipients of state support, run by women, had a loan and an official strategy, and were not in the capital. As for production adaptability, on average, 37% of the firms adjusted or transformed their production and service delivery. The largest share of firms that have adjusted business activities is from Azerbaijan (around 60%) (Figure 6.8). The highest mean values for firm age and stringency index are observed in the sample from 2021. The stringency level was around 60% for all four countries (Figure 6.9). The average proportion of women-run firms with a formal strategy and their own website that changed their manufacturing and service delivery and applied online business activity are the highest in the sample of 2021 as well.

Figure 6.8: Share of Firms that Adapted (Adjusted or Converted) Production Due to COVID-19
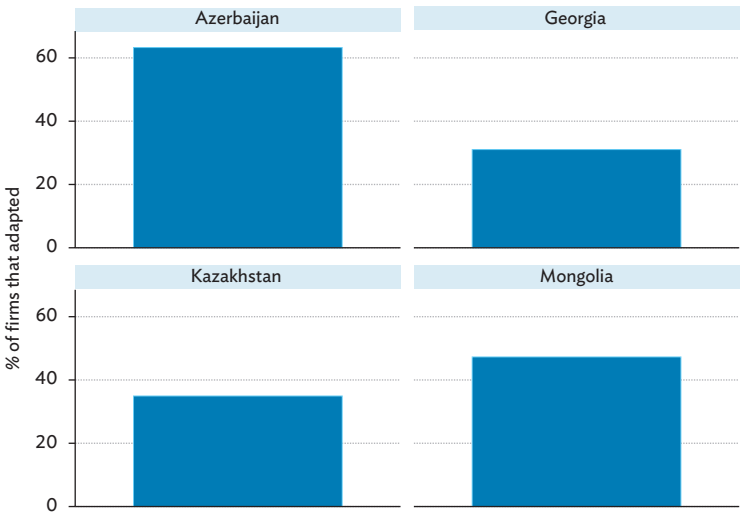
Source: Authors' own calculations using Word Bank data (2021a).

Figure 6.9: Average Stringency Index (from 0 to 100; 100 = strictest)
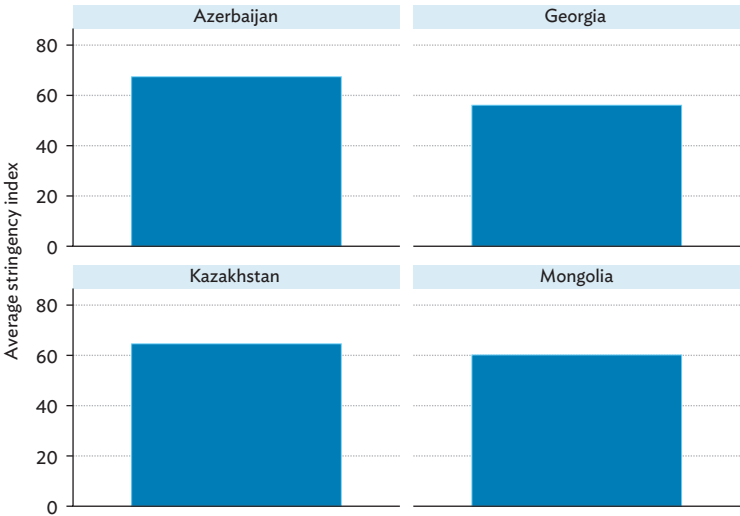
Source: Authors' own calculations using Word Bank data (2021a).

At the same time, compared to the other samples, that from 2021 includes firms whose managers have the least experience on average, and the firms with the lowest average share of direct exports and foreign capital. The average lowest proportions of firms that a) were located in the official capital city, b) had loans in financial institutions, and c) received government support are also calculated for the sample of 2021. The proportion of firms that have managed to transform their production and/or service delivery in the pandemic increased, on average, from 29% to 46% and 44% in 2021 and in the second wave, respectively. The decline from 23% to 18%, on average, in the share of firms that started or increased online business activity in the second wave could be due to a gradual decrease in firms' need for remote work and online business arrangements after the lifting of quarantine and lockdown measures.

6.4 Methodology

This study examines the determinants of firms' adaptability or resilience to pandemic conditions. Two dependent variables are used as indicators of flexibility—that is, the ability of firms to resist or adapt to the COVID-19 crisis—and these dependent variables are discrete, taking the value 0 or 1. The binary response probit regression model is a suitable method to measure the probability that a firm will be able to adjust its activities to the changed conditions (Eq. 1):

$$P(y_i = 1 \mid x_i) = F(\beta_0 + \beta_1 \, Stringency \, Index + \cdots + \beta_k \, x_k) \qquad (1)$$

where y_i is the discrete dependent variable that measures the production adaptability of a firm to the COVID-19 outbreak; it indicates whether a firm has the ability or flexibility to adjust or transform its operations, business, or processes to pandemic conditions. Production adaptability is equal to 1 if the observed firm partially or fully has adjusted or converted its production or the services it offers in response to the COVID-19 outbreak.

Stringency Index and x_k are the set of covariates, or explanatory variables, that are assumed to explain the probability that the firm will adapt, adjust, or change its business and other activities in response to pandemic conditions. We use 16 explanatory variables in our models to track changes in business processes made by firms during the COVID-19 pandemic. The explanatory variables fall within three groups according to their characteristics. Explanations for dependent and explanatory variables are presented in Table 6.3.

Firms' adaptability may differ depending on characteristics such as size, age, location, industry, and managerial and ownership differences.

Firm-specific explanatory variables include size, age, location, and industry of the observed firm. We employ dummy variables for the size and industry of firms retrieved from the respective categorical variables. We use four dummy variables for different firm sizes—micro, small, medium, and large—and five dummies to indicate the industry in which the firms operate. Firm age is measured by the number of years since the firm began its operations. The dummy variable for firm location is 1 if the firm is located in the official capital city, and 0 otherwise. We also include country dummies to identify differences in firm adaptability across countries.

It is assumed that women and/or experienced managers might be more successful managers in times of crisis. The gender and experience of a top manager, expressed in years, are used as additional management characteristics. Innovativeness, the presence of their own website, an official strategy, and foreign capital can also be associated with firms' ability to adapt to changes in the external environment. Including these variables in our models helps us determine whether such characteristics help firms respond better to the consequences of COVID-19 than their counterparts. We expect these characteristics to be associated with more adaptive action, because we consider them as outcomes of the capacity and skills of managers and owners.

Table 6.3: Description of Variables

Dependent Variable	
Production Adaptability	Has this firm adjusted or converted, partially or fully, its production or the services it offers in response to the COVID-19 outbreak? (no – 0, yes – 1)
Explanatory Variables	
Firm characteristics	
Firm age	Number of years from the year the firm began operations to 2020
Capital city	Location of the firm is in the official capital city (no – 0, yes – 1)
Share of direct export	Share of direct exports to total sales (in %)
Innovation in process	The firm has introduced any new or improved processes during the last 3 years (no – 0, yes – 1)
Use of website	At the present time, the firm has its own website (no – 0, yes – 1)
Firm strategy	The firm has a formalized, written business strategy with clear key performance indicators (no – 0, yes – 1)

Table 6.3 *continued*

Manager characteristics	
Experience of manager	Number of years of experience of the top manager in the sector
Gender of manager	0 – if manager is male, 1 – if manager is female
Foreign ownership	Percentage of the firm owned by private foreign individuals, companies, or organizations (in %)
Firm size	1 – micro; 2 – small; 3 – medium; 4 – large
Sector	1 – Food; 2 – Retail; 3 – Manufacturing, garments; 4 – Metal, machinery, and equip. mineral; 5 – Services
Other explanatory variables	
Access to financing	The firm has a line of credit or a loan from a financial institution at the date of Baseline Survey (0 – no; 1 – yes)
Government support	Since the outbreak of COVID-19, firm has received any national or local government support in response to the crisis (0 – no; 1 – yes)
Stringency index	Stringency index (Hale et al. 2021) calculated for the period from 1 January 2020 to the interview date of the Follow-up Survey.
Transport	How much of an obstacle is transport to operations of the firm? 1 – no obstacle; 2 – minor obstacle; 3 – moderate obstacle; 4 – major obstacle; 5 – very severe obstacle

Source: Authors' own calculations using World Bank data (2021a).

It can be assumed that foreign owners may be better able to deal with the consequences of COVID-19, as they have the advantage of using connections and resources from abroad. Differences between firms in terms of participation of foreign capital in the ownership structure are controlled by the foreign ownership variable. This continuous variable indicates the percentage owned by foreign private individuals, companies, or organizations, and takes a value from 0 to 100.

We also use a dummy variable for firm innovativeness, which is equal to 1 if the firm has introduced new or improved processes during last 3 years before the crisis, and 0 otherwise; these processes include methods of manufacturing products or offering services; logistics, delivery, or distribution methods for inputs, products, or services; or supporting activities for processes. To measure the ability of exporter firms to perform direct export operations in a changing environment, we include a percentage of direct exports in total sales in the last completed month as an explanatory variable. We expect firms that are active in innovation are more likely to adapt to the harsh environment caused by COVID-19.

Existence of a website may signify firm digitalization level and is an important means of outreach in terms of sales during the pandemic. To measure firm digitalization level, we use a dummy variable that equals 1 if the firm has its own website, and 0 otherwise. The firm strategy dummy is equal to 1 if the firm has a formalized, written business strategy with clear key performance indicators, and 0 otherwise.

The availability of external resources such as loans or government support can enhance a firm's ability to cope with the negative impacts of a pandemic. At the same time, it is important to recognize whether loans and government support were provided to firms that are innovative, flexible, and resilient to crisis conditions. We also include two exogenous dummies, government support and access to financing, to assess how these environmental factors affected a firm's ability to deal with outbreaks. The dummy variable for government support is 1 if the firm received government support or expected to receive it in the next 3 months from the state or local government due to the COVID-19 crisis. Most firms in Azerbaijan received government support (over 60%), while the least government support was reported in Kazakhstan (less than 20%) (Figure 6.10). The dummy for access to financing takes the value of 1 if the firm currently has a line of credit or a loan from a financial institution, and 0 otherwise.

Figure 6.10: Share of Firms that Received Government Support

Source: Authors' own calculations using Word Bank data (2021a).
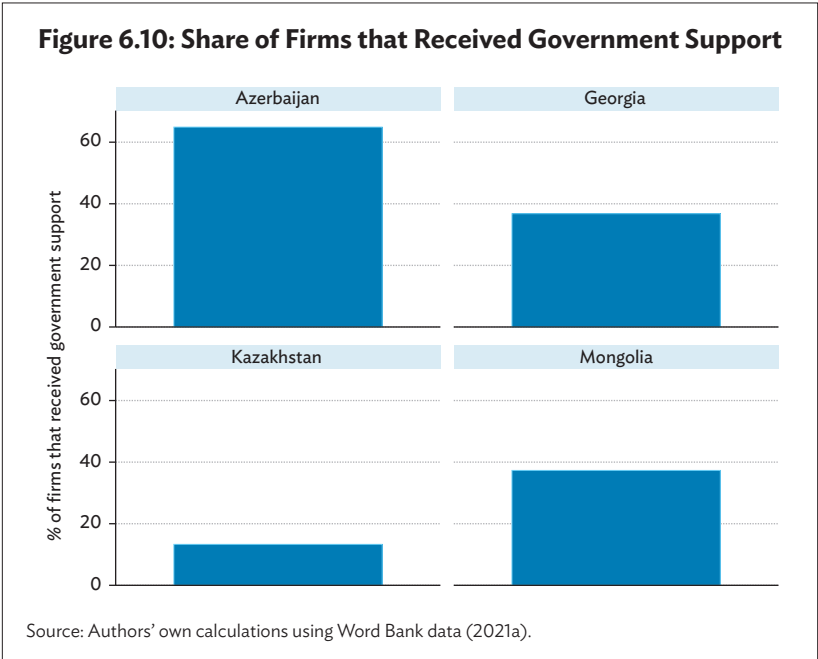
COVID-19 is forcing companies to move their businesses to the domestic market, and to embrace online sales, remote operations, and innovation. The average of the stringency index is used to evaluate the impact of pandemic conditions on firm adaptability and is calculated based on the Oxford COVID-19 Government Response Tracker Indicators from 1 January 2020 to the interview date of the Follow-up Survey. The stringency index calculation methodology is described by Hale et al. (2021). The index indicates the severity of restrictions on the mobility and activities of people and firms. The calculation of the index is based on recommendations and requirements for the closure of workplaces, schools, universities, and public transport; restrictions on leaving home, meetings and public events, and domestic and international travel; and the presence of public information campaigns (Hale et al. 2021). The index takes a value from 0 to 100. The closer the index value is to 0, the less stringent were the restrictions, and the closer the index value is to 100, the stricter the restrictions.

Another independent variable is also used to account for the impact of transport obstacles on the firm's current operations during a pandemic. The variable takes values from 1 to 5, with 1 denoting no transport obstacles and 5 very severe obstacles.

6.5 Empirical Results

Table 6.4 reports the marginal effects based on estimations of Eq. (1) for six samples, and Table A6.1 reports the results for the probit models on probability of production adjustments by firms as a response to pandemic conditions.

The stringency index has a significant positive impact pooled, but a negative impact in the 2020 and Wave II subsamples. As the stringency of COVID-19 restrictions increases, the probability of production adaptation in the pooled sample increases significantly, but decreases in the 2020 and Wave II samples. Wave II, a 1% increase in the index leads to an increase in the likelihood of adaptation by 45%. This finding suggests that, after unexpected economic effects in 2020, firms gradually adapted to the new realities, with this higher adaptability appearing in 2021 surveys.

If the firm has adopted a strategy, has its own website, and is younger, the probability of production adaptability increases significantly. We assume that use of a website and existence of a strategy indicate the presence of communication and network channels that might support production and sales in times of uncertainty. Significant negative impacts of directly exporting and having a male head are confirmed only in the pooled sample.

Table 6.4: Estimation Results (Marginal Effects)

Variables	Total Sample	2020	2021	2021(*)	Wave I: Mongolia and Georgia	Wave II: Mongolia and Georgia
Stringency index	0.0490***	–0.0328*	0.0144	0.00721	–0.126	–0.457*
	(0.0176)	(0.0199)	(0.120)	(0.116)	(0.122)	(0.268)
Use of website	0.0393*	0.0553*	0.00924	0.0279	0.0623*	0.0479
	(0.0224)	(0.0283)	(0.0349)	(0.0275)	(0.0362)	(0.0402)
Share of direct export	–0.000934*	–0.000669	–0.00054	–0.000603	–0.000638	–0.000624
	(0.000567)	(0.000611)	(0.00125)	(0.000721)	(0.000886)	(0.000863)
Gender of manager (1=female)	0.0399*	0.0473	0.0225	0.0462	0.0176	0.0190
	(0.0239)	(0.0316)	(0.0355)	(0.0294)	(0.0388)	(0.0422)
Experience of manager	–0.000982	–0.00157	–0.00023	–0.000824	–0.00142	–0.00105
	(0.00113)	(0.00142)	(0.00177)	(0.00140)	(0.00181)	(0.00198)
Firm age	–0.00244**	–0.0039**	–0.00095	–0.00170	–0.00392*	–0.000527
	(0.00119)	(0.00168)	(0.00177)	(0.00145)	(0.00201)	(0.00192)
Firm strategy	0.0385*	0.0867***	0.000662	0.0268	0.0755**	0.0630
	(0.0228)	(0.0307)	(0.0329)	(0.0275)	(0.0384)	(0.0425)
Government support	0.0341	–0.00481	0.110***	0.0707**	–0.00634	0.0453
	(0.0225)	(0.0268)	(0.0382)	(0.0291)	(0.0340)	(0.0374)
Foreign ownership	0.00130***	0.00110**	0.00136	0.00131**	0.000961	0.00139*
	(0.000478)	(0.000518)	(0.00100)	(0.000631)	(0.000686)	(0.000781)
Access to financing	–0.0103	–0.0221	0.0192	0.00788	–0.0326	–0.00446
	(0.0216)	(0.0267)	(0.0343)	(0.0272)	(0.0335)	(0.0374)
Transport	0.0124	0.0121	0.00734	0.00524	0.0206	0.00849
	(0.00858)	(0.0101)	(0.0148)	(0.0108)	(0.0132)	(0.0146)
Innovation in process	0.0721***	0.0716**	0.0791*	0.0891***	0.0493	0.103**
	(0.0260)	(0.0329)	(0.0405)	(0.0327)	(0.0405)	(0.0436)
Firm size (reference category: Micro)						
Small	0.100	0.106	0.119	0.0266	0.148*	0.00914
	(0.0743)	(0.0722)	(0.178)	(0.112)	(0.0821)	(0.116)
Medium	0.123	0.107	0.166	0.0532	0.159*	0.0305
	(0.0758)	(0.0744)	(0.179)	(0.114)	(0.0850)	(0.120)
Large	0.0581	0.0622	0.0744	–0.0551	0.180*	–0.107
	(0.0789)	(0.0797)	(0.182)	(0.116)	(0.0937)	(0.125)
Sector (reference category: Food)						
Retail	–0.0297	0.00595	–0.0937	–0.0611	0.0202	0.0261
	(0.0377)	(0.0441)	(0.0643)	(0.0471)	(0.0575)	(0.0660)
Manufacturing, Garments	0.0254	0.0166	0.0250	0.0297	0.0180	–0.0126
	(0.0354)	(0.0429)	(0.0572)	(0.0432)	(0.0560)	(0.0635)
Metal, Machinery, and Equip. Mineral	–0.0526		–0.0961	–0.0685		
	(0.0477)		(0.0614)	(0.0516)		

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Table 6.4 *continued*

Variables	Total Sample	2020	2021	2021(*)	Wave I: Mongolia and Georgia	Wave II: Mongolia and Georgia
Services	−0.0462	0.00341	−0.136**	−0.0838**	0.0235	−0.0119
	(0.0342)	(0.0397)	(0.0586)	(0.0424)	(0.0527)	(0.0606)
Capital city	0.00993	−0.0514*	0.124***	0.109***	−0.132***	0.0525
	(0.0243)	(0.0281)	(0.0437)	(0.0326)	(0.0341)	(0.0408)
Country dummy	+	+	+	+	+	+
Observations	2,146	1,182	964	1,398	748	655

Notes: Standard errors are in parentheses. ***, **, and* represent statistical significance of 1%, 5%, and 10%, respectively. Column "2021(*)" indicate the sample includes observations for 2021 and second wave of Georgia.
Source: Authors' own calculations using Word Bank data (2021a).

Receiving government support and being located in the capital city significantly increases the likelihood of production adaptability by an average of about 10% in the 2021 subsamples. This indicates that government support measures since the beginning of the COVID-19 pandemic have a positive impact later. The empirical results also show that firms with foreign-owned shares tended to adjust their production partially or completely in response to COVID-19. The influence of foreign capital participation on the likelihood of adaptation is statistically significant and positive in almost all models.

Firms that had introduced any new or improved process during the last 3 years in the baseline survey appeared to have transformed their production as a response to COVID-19, as this increases the probability of production adaptability by 7%–10%. These results are in line with our expectations that innovative companies are more resilient to changing conditions.

The effects of location in the capital city are significant in explaining the likelihood of production adjustments or transformations during the pandemic in four models. According to the results, firms surveyed in later rounds, which includes observations for 2021 and the second wave for Georgia, are more likely to adapt their production activities compared to companies located outside the capital city. By contrast, those interviewed in the earlier wave of the survey were less likely to adapt their production activities compared to companies located outside the capital. The firm size dummies are not statistically significant, except for the results for the Wave I sample. Most of the results for firm sector dummies are not statistically significant either, except for the service sector in 2021. Most of the results for the sector-specific

dummies are also not statistically significant, which indicates that the overall economy was negatively affected by COVID-19, and this negative effect was higher for firms operating in the service sector.

6.6 Conclusion

This study empirically investigated factors affecting firms' ability to adjust production in response to the COVID-19 outbreak using firm-level survey data from the Enterprise Survey implemented by the World Bank Group, including a standard Enterprise Survey (Baseline) and two waves of Follow-up Surveys conducted in 2020 and 2021. We used data from four CAREC member countries: Azerbaijan, Georgia, Kazakhstan, and Mongolia. Using a probit model, we assessed how different factors, including firm characteristics and government policy, affected the probability that a firm would be able to adjust its activities to the changed conditions. The results indicated that firms that adapted to the COVID-19 crisis tended to be younger firms with foreign investment and those that were innovative in the recent past, had a female manager, a formal firm strategy with key performance indicators, and their own website. Overall, the findings indicate that, during the later rounds of the survey, firms were adapting to the new realities. Innovation and firm strategy are important, along with government support, although its effect appeared later (in 2021).

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Appendix 6.1

Table A6.1: Estimation Results for Probit Models
on Probability of Production Adaptation of Firms to COVID-19
(Coefficient Estimates)

Variables	Total Sample	2020	2021	2021(*)	Survey Round I: Mongolia and Georgia	Survey Round II: Mongolia and Georgia
Stringency index	0.138***	−0.101	0.0398	0.0206	−0.388	−1.329*
	(0.0500)	(0.0613)	(0.333)	(0.331)	(0.377)	(0.785)
Use of website	0.111*	0.169*	0.0256	0.0795	0.192*	0.139
	(0.0632)	(0.0872)	(0.0966)	(0.0786)	(0.112)	(0.117)
Share of direct export	−0.00263	−0.00205	−0.00149	−0.00172	−0.00197	−0.00182
	(0.00160)	(0.00188)	(0.00347)	(0.00206)	(0.00274)	(0.00252)
Gender of manager (1=female)	0.112*	0.145	0.0624	0.132	0.0543	0.0554
	(0.0675)	(0.0972)	(0.0983)	(0.0842)	(0.120)	(0.123)
Experience of manager	−0.00277	−0.00483	−0.00062	−0.00235	−0.00438	−0.00307
	(0.00319)	(0.00437)	(0.00490)	(0.00399)	(0.00559)	(0.00577)
Firm age	−0.00688**	−0.0119**	−0.00264	−0.00484	−0.0121*	−0.00153
	(0.00336)	(0.00516)	(0.00490)	(0.00415)	(0.00624)	(0.00559)
Firm strategy	0.109*	0.266***	0.00184	0.0764	0.233*	0.183
	(0.0644)	(0.0949)	(0.0912)	(0.0784)	(0.119)	(0.124)
Government support	0.0963	−0.0147	0.305***	0.202**	−0.0196	0.132
	(0.0637)	(0.0823)	(0.107)	(0.0836)	(0.105)	(0.109)
Foreign ownership	0.00367***	0.00337**	0.00376	0.00372**	0.00297	0.00404*
	(0.00135)	(0.00160)	(0.00279)	(0.00181)	(0.00213)	(0.00229)
Access to financing	−0.0289	−0.0678	0.0532	0.0225	−0.101	−0.0130
	(0.0610)	(0.0820)	(0.0952)	(0.0777)	(0.104)	(0.109)
Transport	0.0350	0.0371	0.0203	0.0150	0.0635	0.0247
	(0.0243)	(0.0310)	(0.0409)	(0.0309)	(0.0408)	(0.0426)
Innovation in process	0.204***	0.219**	0.219*	0.254***	0.152	0.300**
	(0.0737)	(0.101)	(0.113)	(0.0941)	(0.125)	(0.129)
Firm size (*reference: Micro*)						
Small	0.303	0.357	0.350	0.0764	0.550	0.0266
	(0.244)	(0.274)	(0.561)	(0.326)	(0.382)	(0.339)
Medium	0.366	0.360	0.478	0.151	0.586	0.0879
	(0.247)	(0.279)	(0.565)	(0.330)	(0.389)	(0.349)
Large	0.181	0.219	0.224	−0.166	0.648	−0.332
	(0.257)	(0.297)	(0.574)	(0.342)	(0.406)	(0.373)

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Table A6.1 *continued*

Variables	Total Sample	2020	2021	2021(*)	Survey Round I: Mongolia and Georgia	Survey Round II: Mongolia and Georgia
Sector (*reference: Food*)						
Retail	−0.0832	0.0183	−0.255	−0.173	0.0633	0.0750
	(0.105)	(0.136)	(0.176)	(0.133)	(0.181)	(0.190)
Manufacturing, Garments	0.0694	0.0509	0.0668	0.0812	0.0565	−0.0368
	(0.0969)	(0.132)	(0.153)	(0.118)	(0.177)	(0.186)
Metal, Machinery, and Equip. Mineral	−0.149		−0.262	−0.194		
	(0.137)		(0.167)	(0.147)		
Services	−0.131	0.0105	−0.376**	−0.239**	0.0733	−0.0347
	(0.0960)	(0.123)	(0.162)	(0.120)	(0.166)	(0.177)
Capital city	0.0279	−0.160*	0.334***	0.302***	−0.423***	0.151
	(0.0682)	(0.0891)	(0.116)	(0.0890)	(0.116)	(0.117)
Country dummy	+	+	+	+	+	+
Constant	−9.463***	4.792	−3.122	−1.509	20.49	74.65*
	(3.386)	(3.449)	(22.50)	(22.30)	(20.84)	(44.60)
Observations	2,146	1,182	964	1,398	748	655
Pseudo R-squared	0.0374	0.0431	0.0703	0.0714	0.0550	0.0871
LR	103.6	61.25	92.16	132.2	49.65	75.44
P-value	0	4.56e−06	1.47e−10	0	0.000249	2.30e−08
LogLik	−1,333	−679.5	−609.1	−859.7	−426.5	−395.3

Notes: Standard errors are in parentheses. ***, **, and * represent statistical significance of 1%, 5%, and 10%, respectively. Column "2021(*)" indicates the sample includes observations for 2021 and for the second wave of Georgia.

Source: Authors' own calculations using Word Bank data (2021a).

COVID-19 Impacts on Human Development

7

Impacts of COVID-19 on Households in CAREC Countries

Dina Azhgaliyeva, Ranjeeta Mishra,
Long Q. Trinh, and Peter Morgan

7.1 Introduction

The impacts of the coronavirus disease (COVID-19) pandemic have heavily affected the member countries of Central Asia Regional Economic Cooperation (CAREC), which are Afghanistan, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, the People's Republic of China (PRC), Tajikistan, Turkmenistan, and Uzbekistan.

The crisis has caused falls in demand and supply due both to uncertainty and policy interventions such as lockdowns, social distancing, and travel restrictions, which are having a severe impact on CAREC countries. These negative impacts manifest through several channels, including loss of employment or reduced working hours, loss of sales and income of household businesses, restricted travel to work, increased need to stay at home to look after small children or sick household members, and higher prices and/or lack of availability of staple items (Morgan and Trinh 2021). In order to develop appropriate policy responses, it is necessary to understand the current situation of households. As part of the Asian Development Bank's overall strategy to deal with the current crisis, the Asian Development Bank Institute (ADBI) has been tasked with surveying households to better understand the size, aspects, and incidence of impacts on vulnerable people. Assessing the magnitude of these challenges and deploying effective policy responses will play a critical role in determining the CAREC region's potential to efficiently recover and proceed with economic development and regional integration in accordance with the CAREC 2030 Strategic Framework.

The main contribution of this chapter is that it provides empirical evidence on the impact of the COVID-19 crisis on households in the CAREC region. Computer-assisted telephone interviews were conducted in 10 countries, namely Afghanistan, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan. The PRC, which is also part of CAREC, was excluded from the household survey and analysis compiled in this study. Face-to-face surveys were impractical due to the lockdowns being implemented in response to the pandemic and risks of spreading COVID-19. The surveys were carried out from mid-May to the end of August 2021. The surveys mainly cover the period from June to December 2020. Representative samples of 1,000 households in each country were surveyed. We compare June 2020 and December 2020 (both periods during the COVID-19 pandemic) in order to see how households were able to cope with COVID-19 6 months after a big spike in the number of cases and large lockdowns in CAREC member countries (excluding the PRC). In particular, we assess how household income, expenditure, and financial difficulty changed from June to December 2020.

7.2 Literature Review

This research is inspired by, and closely related to, Morgan and Trinh (2021). In 2020, they carried out computer-assisted telephone interviews of households in eight Southeast Asian countries: Cambodia, the Lao People's Democratic Republic (Lao PDR), Indonesia, Malaysia, Myanmar, the Philippines, Thailand, and Viet Nam. A nearly identical (with modifications to facilitate understanding for the households from the CAREC region) survey questionnaire was used for this study.

Morgan and Trinh (2021) demonstrated that various household characteristics, including pre-COVID-19 household income class, household demographic factors, and COVID-19-induced factors such as having at least one person who lost their job or being located in lockdown areas, all affected the likelihood of a decline in income. Having at least one person who lost their job or had reduced working hours increased the likelihood of a household experiencing financial difficulties. The gender of the household head also had a significant impact on financial difficulties and income decline due to COVID-19. For low-income groups, income in female-headed households was found to decline significantly more than in male-headed households due to the pandemic. In addition, female-headed households had more financial difficulties due to COVID-19 than male-headed households did.

Literature studying the impact of the COVID-19 crisis in the CAREC region is limited. Compared with 2019, CAREC and ADB (2021) found for CAREC in 2020 that there were 40 million fewer airline passengers,

$7 billion lower passenger revenues, 1 million travel and tourism jobs at risk, an $11 billion reduction in international visitor spending, a $27 billion reduction in travel and tourism contribution to gross domestic product, 33 million fewer visitor arrivals, and 5.5 million fewer visitor arrivals by air. Thus, restrictions on travel could affect households through loss of jobs and reduced working hours and income, especially those sourcing income from hospitality, travel, and tourism.

The recent book published by ADBI (Beirne, Morgan, and Sonobe 2021) titled *COVID-19 Impacts and Policy Options: An Asian Perspective* provides crucial insights into the economic effects and policy implications of the COVID-19 pandemic in the region. This book demonstrates the disproportionately negative effects on low-income households, particularly in poor and vulnerable countries. Lower employment and incomes have increased household financial distress. The book also provides policy recommendations for supporting vulnerable households, such as enhancing social security protection during the pandemic in order to limit the effects of unemployment. Temporary social protection measures should also be extended to vulnerable migrant workers.

Holzhacker (2020) suggested in early 2020 that potential economic implications of the COVID-19 outbreak in the PRC have a potentially negative impact on the economies of the CAREC region mainly through commodity prices, travel, and trade.

This chapter contributes to the literature by providing empirical evidence on households' income, expenditure, and financial difficulty during the COVID-19 pandemic in the CAREC region (excluding the PRC).

7.3 Spread of COVID-19 and Government Responses

7.3.1 COVID-19 in CAREC

Figures 7.1–7.3 show the progress of COVID-19 in nine CAREC countries. They show daily net changes in cases of COVID-19, deaths, and vaccination doses. Unfortunately, data on COVID-19 cases, including deaths, from Hale et al. (2020) do not include Turkmenistan, and vaccination data available from Bloomberg are available only for five out of 10 CAREC countries (excluding the PRC). Cases of COVID-19 and deaths were greater in the PRC only in early 2020. Later it spread to other CAREC countries. Despite a smaller population, Georgia had more cases of COVID-19, even more than in Pakistan. Deaths were higher in Georgia, Pakistan, and Afghanistan. Vaccination started at the end of 2020 in the PRC. Vaccine doses remain high in the PRC.
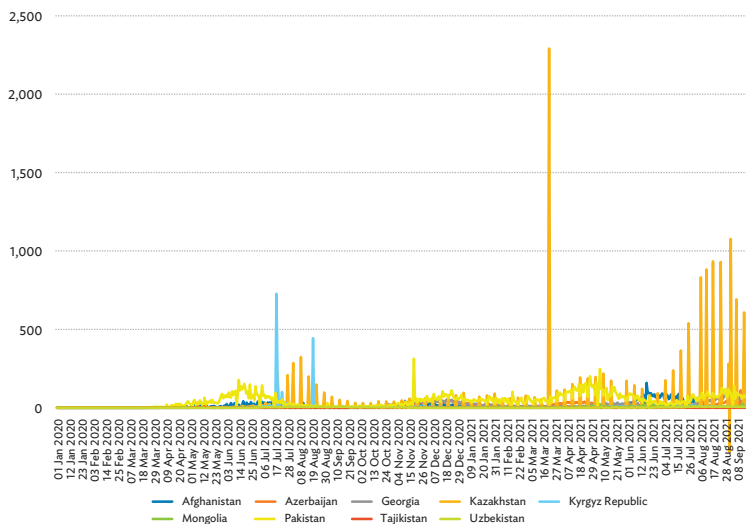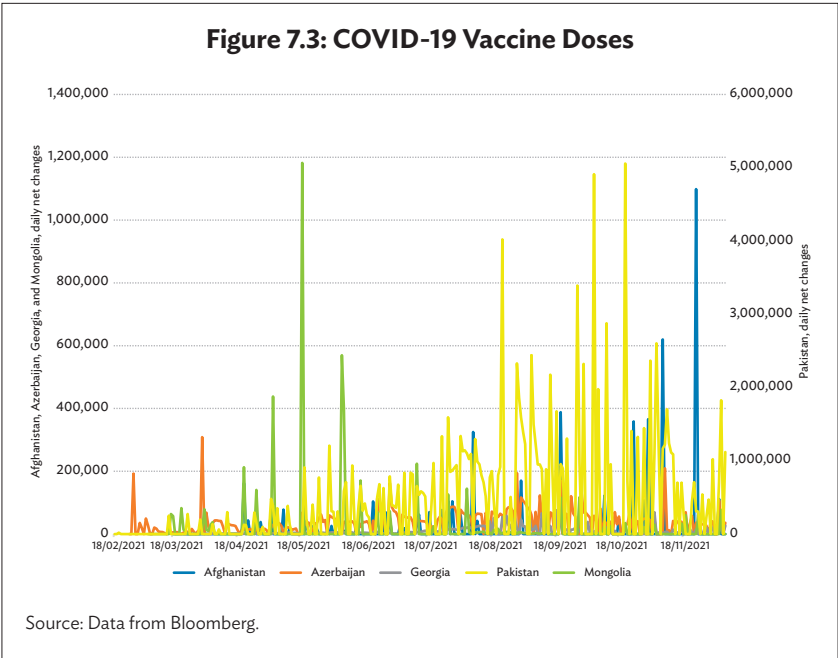
Figure 7.1: COVID-19 Cases
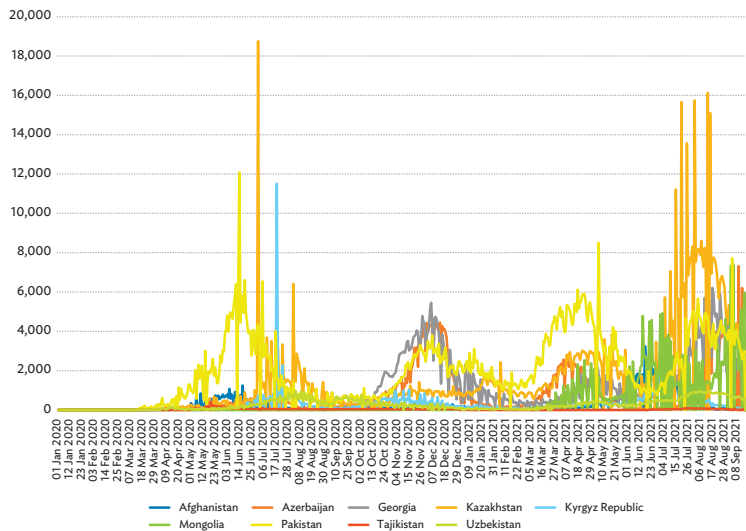
Source: Data from Our World in Data (2021).

Figure 7.2: COVID-19 Deaths

Source: Data from Our Word in Data (2021).

Figure 7.3: COVID-19 Vaccine Doses

Source: Data from Bloomberg.

7.3.2 Government Responses

CAREC countries have implemented various measures, including school closures, lockdowns, social distancing requirements, and border closures. However, the times at which each country implemented these measures, the duration, and the stringency of these policies vary across countries. Figures 7.4–7.7 show stringency indices of the measures that CAREC countries have adopted to contain the spread of COVID-19, as calculated by a team at Oxford University (Hale et al. 2021). Table 7.1 provides a description of the stringency index of government nonpharmaceutical intervention measures, and Figures 7.4–7.7 demonstrate these indexes.

The Blavatnik School of Government at the University of Oxford provides the Oxford COVID-19 Government Response Tracker (Blavatnik School of Government 2021; Hale et al. 2021). In order to make data comparable across countries, they measure policy responses as indices on a scale of 0–100: (i) overall government response index; (ii) containment and health index; (iii) stringency index; and (iv) economic support index. It measures how many of the relevant indicators a government has acted upon, and to what degree, using simple, additive, unweighted indices.

Other data sets of policy responses measured are provided in Appendix 9.1.

Table 7.1: Policy Indices

Policy Index	Description
Overall government response index	Response of governments to COVID-19
Containment and health index	"Lockdown," closures, testing policy, contact tracing, short-term investment in health care and vaccines
Stringency index	Strictness of "lockdown style" policies that restrict people's behavior
Economic support index	Income support and debt relief

Source: Hale et al. (2021).

Figure 7.4: Overall Government Response Index in CAREC Countries
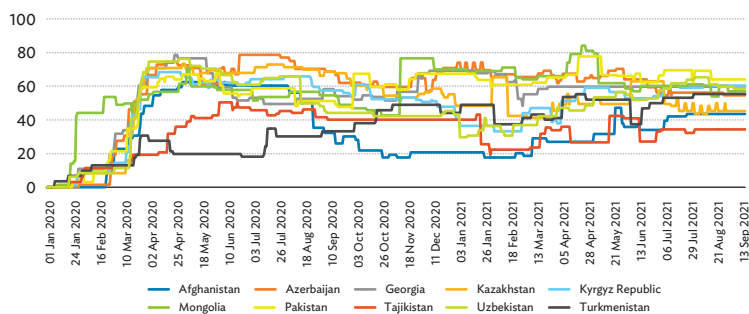
CAREC = Central Asia Regional Economic Cooperation.

Source: Data from Hale et al. (2021).

Figure 7.5: Containment and Health Index in CAREC Countries
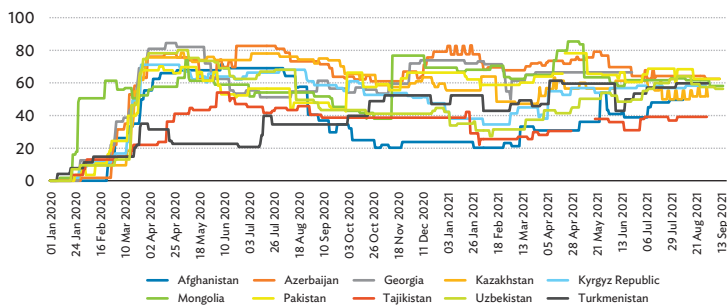
CAREC = Central Asia Regional Economic Cooperation.

Source: Data from Hale et al. (2021).

Figure 7.6: Stringency Index in CAREC Countries
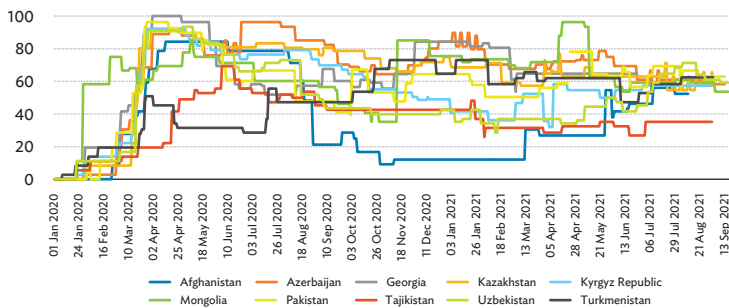
CAREC = Central Asia Regional Economic Cooperation.

Source: Data from Hale et al. (2021).

Figure 7.7: Economic Support in CAREC Countries
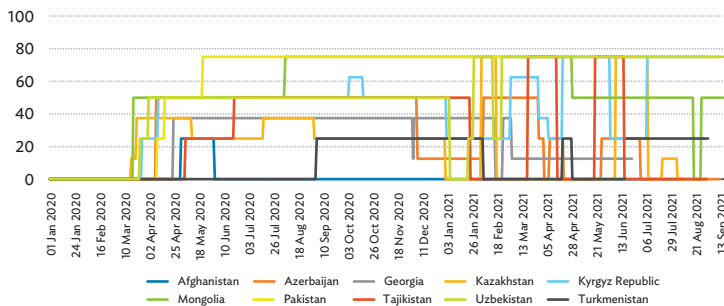
CAREC = Central Asia Regional Economic Cooperation.

Source: Data from Hale et al. (2021).

7.3.3 Financing COVID-19 Responses

The Asian Development Bank (ADB) COVID-19 Policy Database displays the measures taken and monetary amounts announced or estimated by country (Figure 7.8). Data show the amounts of funding that governments have announced will be allocated to each measure. Zero values mean that no amount is provided because the measure does not entail spending, e.g., interest rate reductions.

Figure 7.8: Income Support: Subsidies to Individuals and Households
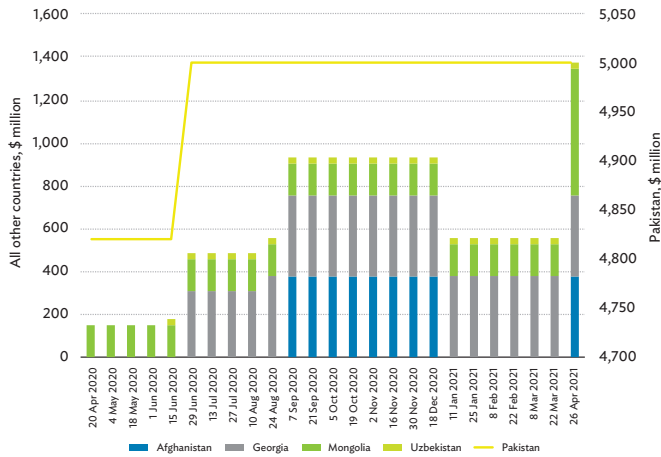
Source: Data from ADB (2021a).

Pandemic loans (February 2020–August 2021) were obtained by all CAREC countries, mainly by Pakistan (24%), Uzbekistan (23%), the PRC (20%), and Kazakhstan (13%) (Figure 7.9). Pandemic loan volume was particularly high during April–August 2020 (Figure 7.10). Nearly all of these loans (90%) were provided to governments.

Figure 7.9: Pandemic Loans by Country (% of all pandemic loans)
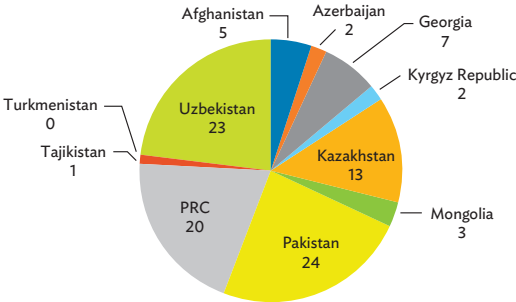
PRC = People's Republic of China.

Source: Data from Bloomberg.

Figure 7.10: Pandemic Loans
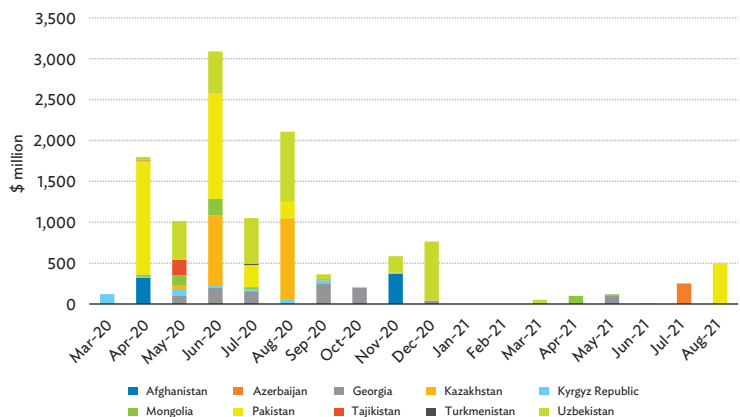
Source: Data from Bloomberg.

International financial institutions provided financial support to governments for responding to COVID-19. ADB's COVID-19 response consists of a $20 billion package announced in April 2020 with a breakdown of commitment across all CAREC countries (Figure 7.11). Support was provided in different forms, such as loans, grants, and

Figure 7.11: Committed Amount of Asian Development Bank COVID-19 Response in the CAREC Region ($ million)
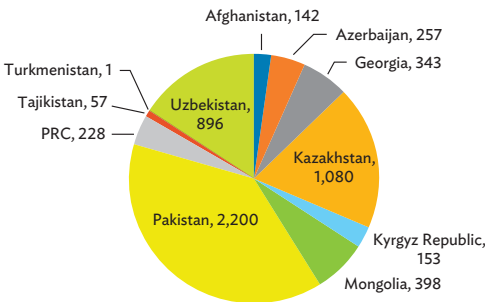
CAREC = Central Asia Regional Economic Cooperation, PRC = People's Republic of China.

Source: Data from ADB (2021b).

technical assistance. The ADB COVID-19 response package supports its developing member countries in countering the severe macroeconomic and health impacts caused by COVID-19.

7.4 Asian Development Bank Institute Household Survey in CAREC Countries

The household survey was carried out in 10 out of 11 CAREC member countries: Afghanistan, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan.

The survey was designed by ADBI and implemented by nine survey companies in the respective countries. The survey was implemented during May–July 2021 following pilot tests. The distribution of the sample across rural/urban and household income groups (socioeconomic class, or SEC) is provided in Table 7.2. Income group allocation in local currency for each country is provided in Table A7.2 (Appendix 7.2). All the fieldwork was finished by the end of August 2021. The household survey in Afghanistan was finished by 17 August 2021. Major characteristics of the survey included:

- Computer-assisted telephone survey (due to COVID-19);
- Respondent: household head or person knowledgeable in household finance;
- Length of interview: around 20 minutes (in some countries longer, partly due to screening questions); and
- Questionnaire included information on:
  (i)   Characteristics of the households, including number of members, household head gender, number of employed household members, number in school, age of head of household, education level, urban vs. rural residence, and income, including types of income;
  (ii) Changes in income, employment, and working hours in December 2020 compared with the base period of June 2020; and
  (iii) Whether or not the household experienced financial difficulties and, if so, what coping measures it used, including reducing consumption, borrowing, delaying payments, and applying for government aid.

Table 7.2: Characteristics of the Sample

Country	Total Sample Households	Rural	Urban	SEC 1 (Poorest)	SEC 2	SEC 3	SEC 4 (Richest)	Languages
Afghanistan	1,064	315	749	252	417	269	126	Dari, Pashto
Azerbaijan	1,000	545	455	135	213	213	439	Azerbaijani, Russian
Georgia	1,024	406	618	160	253	192	419	Georgian, Russian, Armenian, and Azerbaijani
Kazakhstan	1,066	647	419	144	234	217	471	Kazakh and Russian
Kyrgyz Republic	1,001	649	352	217	275	249	260	Kyrgyz and Russian
Mongolia	1,006	318	688	139	359	230	278	Mongolian
Pakistan	1,056	681	375	211	189	233	423	Urdu, Balochi, Pashto, Punjabi, and Sindhi
Tajikistan	1,011	281	730	279	269	257	206	Tajik, Uzbek, Russian
Turkmenistan	1,000	462	538	110	277	277	336	Turkmen, Uzbek, Russian
Uzbekistan	1,001	511	490	233	252	215	301	Uzbek, Russian

Note: SEC = socioeconomic class.

Source: Authors' calculation based on ADBI's database.

7.5 COVID-19 Impacts and Coping Strategies

7.5.1 Determinants of Having Income Decline Due to COVID-19

Figure 7.12 presents the impact of COVID-19 on household income change in December 2020 in comparison to June 2020. The figure shows that about 45% of households reported income declines. Income decline ranges from 80% of households (Pakistan) to 20% of households (Mongolia). Among households with a declining income, the largest share (17.3%) reported that their income had fallen by 1%–25%, 15.9% reported that their income had declined by 26%–50%, and 12.3% of households reported over a 50% income decline.

Figure 7.12: Change of Household Income

Source: Authors' calculation based on ADBI's database.
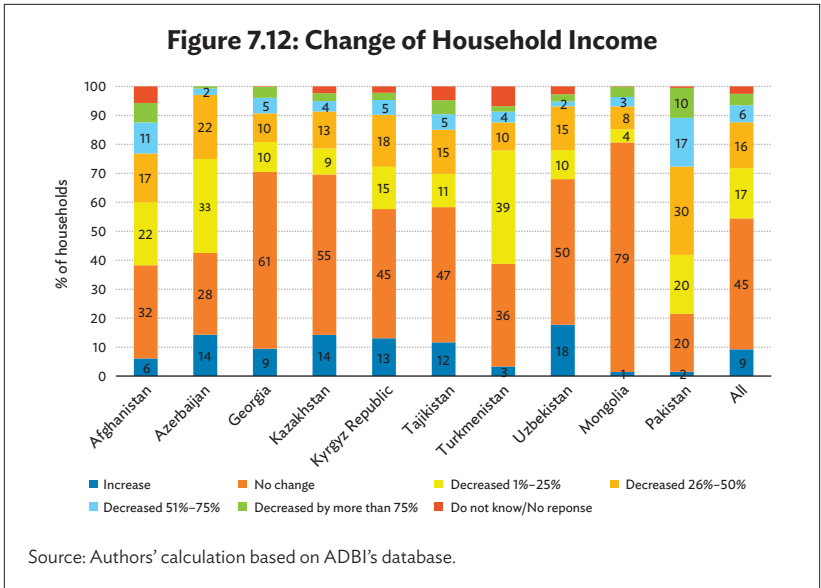
Figure 7.13 presents changes in income by source. Income from household businesses or self-employment declines the most, with 42% of households with income from those sources reporting declines. Income from agriculture-related activities and from wages and salaries did not decline as much as that from household business or self-employment, although still about 31% and 32% of households with income from these sources, respectively, reported declines.

Figure 7.14 presents changes in income by income SEC 1–4 levels (from poor to rich). Among income levels, the most households from SEC 3 (43%) reported an income decline. Fewer households from the other income levels, i.e., SEC 1, SEC 2, and SEC 4, reported an income decline. Thirty-seven percent of SEC 1 income-level households experienced a decline in income, while 39% of households from the SEC 2 income level and 38% from the SEC 4 income level reported an income decline.

Figure 7.15 presents a decline in income across income sources for each country. Household business income was the income source that fell the most in all countries except Afghanistan and Turkmenistan, where wage income showed the steepest decline (29% and 51%, respectively).

Figure 7.13: Change of Household Income by Source of Income
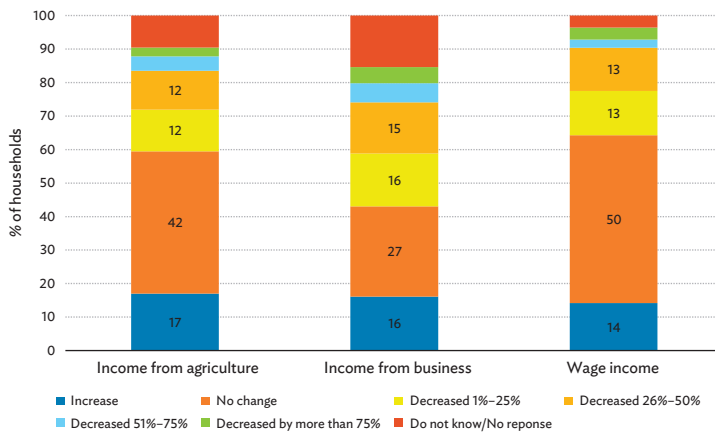
Source: Authors' calculation based on ADBI's database.

Figure 7.14: Change in Income by Income Level
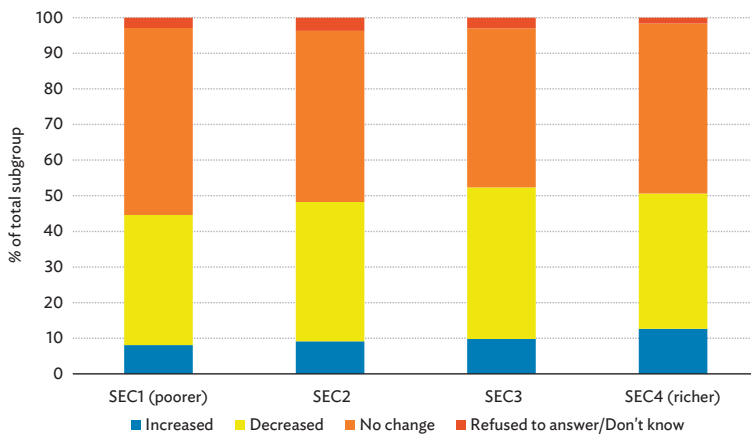
SEC = socioeconomic class.

Source: Authors' calculation based on ADBI's database.

Figure 7.15: Sources of Income Decline by Country

Source: Authors' calculation based on ADBI's database.
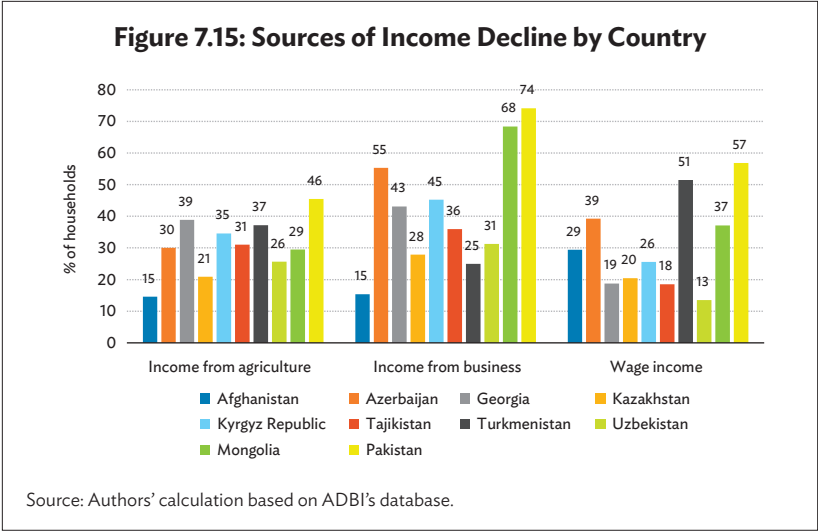
We examine the effects of the COVID-19 pandemic on household income. Following Morgan and Trinh (2021), we estimate the following equation:

$$iDecline_i = \alpha_0 + \alpha_1 SEC_i + \alpha_2 HH_i + \alpha_3 COVID_i + \epsilon_i, \qquad (1)$$

in which $iDecline_i$ is a dummy variable that takes the value of one if household I experienced a decline in income during the COVID-19 period; SEC_i is a set of dummy variables indicating the socioeconomic class that household I belongs to; HH_i is a set of household characteristics including sources of income; household head's education, age, and gender; household location (i.e., rural vs. urban areas); and household size (total number of household members); $COVID_i$ is a set of variables reflecting COVID-19-induced effects such as whether the household was located in a lockdown area or not; and ϵ_i is the error term. We estimate the above equations for pooled data on 11 countries (with country dummy being controlled) and separately for each country in our sample.

Table 7.3 presents our estimation results. We found that, on average, the socioeconomic class of household on average is not related to the likelihood of experiencing a decline in income, suggesting that the COVID-19 pandemic affected the income of all households relatively equally regardless of their economic status before the pandemic. This is also found in Association of Southeast Asian Nations (ASEAN)

households (Morgan and Trinh 2021). However, we find the COVID-19 pandemic may have different impacts on different countries. For example, in Afghanistan, households in the second SEC are less likely to suffer from income decline than households in the poorest SEC, while there is no difference between richer groups (SECs 3 and 4) and the poorest groups. Or in the case of Azerbaijan, while there is no difference among households in SECs 1, 2, and 4, households in the middle upper class (SEC 3) are more likely to experience a decline in income than the poorest group (SEC 1 as our reference group). The situation is similar in Tajikistan where middle-income households (in SECs 2 and 3) are more prone to income decline than households in the poorest groups. Among these 10 countries, we only find that richer households are less likely to suffer income decline than the poorest households are.

Different sources of income may also have different effects on the likelihood of decline in income. On average, households with income from wages tended to experience a decline in income while those with income from agricultural production or from household businesses or self-employment were not different from households in the reference group. This is different from the situation in ASEAN economies, where households with income from agricultural production and from household businesses or self-employment were more likely to experience a decline in income (Morgan and Trinh 2021). The difference may be due to the structure of the economy between ASEAN and CAREC countries. ASEAN economies seem more dependent on small-scale agricultural production and household businesses.

While the effect of income source on the likelihood of experiencing income decline is quite similar among ASEAN economies, we observe a large difference among CAREC countries. For example, those households with income from agriculture experienced a decline in income in the Kyrgyz Republic but were less likely to have a decreased income in Afghanistan. Households with wages as income sources were more likely to experience income declines in Afghanistan, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, and Pakistan, but less likely to do so in Azerbaijan, and there were no effects in the other three countries. Similarly, households with income from household businesses or self-employment were more likely to experience income declines in Afghanistan and Mongolia but less likely to experience them in Tajikistan and Uzbekistan. In other countries, households with income from household businesses or self-employment were not different from households without such sources of income.

The household head's education level on average was negatively associated with the likelihood of experiencing an income decline. For example, a household head with a high school diploma is 16.1 percentage

Table 7.3: Determinants of Income Decline Due to the COVID-19 Pandemic

Variable	All (1)	Afghanistan (2)	Azerbaijan (3)	Georgia (4)	Kazakhstan (5)	Kyrgyz Republic (6)	Tajikistan (7)	Turkmenistan (8)	Uzbekistan (9)	Mongolia (10)	Pakistan (11)
HH head female	-0.110*	-0.620	0.195	-0.286*	0.0294	-0.105	-0.117	0.437*	-0.594***	-0.373*	0.219
	(0.057)	(0.381)	(0.195)	(0.150)	(0.140)	(0.156)	(0.175)	(0.237)	(0.217)	(0.222)	(0.285)
HH head education											
• Below high school	-0.007***	-0.019***	-0.003	-0.013**	-0.004	-0.003	-0.011**	0.004	-0.012**	-0.032***	0.017***
	(0.00157)	(0.00492)	(0.00586)	(0.00515)	(0.00541)	(0.00524)	(0.00452)	(0.00539)	(0.00550)	(0.00737)	(0.00532)
• High school	-0.161**	-0.612***	0.209	0.365	0.240	-0.323	-0.019	-0.224	-0.308	-0.372	0.130
	(0.073)	(0.188)	(0.621)	(0.419)	(0.426)	(0.240)	(0.232)	(0.226)	(0.367)	(0.234)	(0.205)
• Above high school	-0.275***	-0.702***	-0.0574	0.332	0.0874	-0.626***	-0.202	-0.104	-0.373	-0.926***	0.309
	(0.071)	(0.166)	(0.618)	(0.405)	(0.414)	(0.237)	(0.229)	(0.219)	(0.348)	(0.260)	(0.223)
Located in lockdown area	0.265***	-1.436***	0.960***	0.527***	0.286*	0.288*	0.426***	-0.488	0.652***		-0.039
	(0.058)	(0.266)	(0.211)	(0.143)	(0.162)	(0.149)	(0.135)	(1.017)	(0.192)		(0.265)
Income group (base: SEC 1 poorer)											
• SEC 2	-0.016	-0.428**	0.147	0.195	-0.398*	0.223	0.631***	-0.093	-0.024	0.145	-0.251
	(0.065)	(0.186)	(0.231)	(0.230)	(0.225)	(0.191)	(0.183)	(0.233)	(0.204)	(0.241)	(0.276)
• SEC 3	-0.020	-0.214	0.454*	-0.018	-0.502**	0.123	0.574***	0.085	-0.051	-0.094	-0.578**
	(0.0674)	(0.202)	(0.236)	(0.254)	(0.229)	(0.199)	(0.186)	(0.234)	(0.213)	(0.317)	(0.257)
• SEC 4 (richer)	-0.078	-0.907***	0.132	-0.029	-0.648***	0.417**	0.127	0.035	-0.047	0.128	-0.283
	(0.065)	(0.250)	(0.216)	(0.233)	(0.207)	(0.200)	(0.205)	(0.228)	(0.200)	(0.258)	(0.239)

Table 7.3 *continued*

Variable	All (1)	Afghanistan (2)	Azerbaijan (3)	Georgia (4)	Kazakhstan (5)	Kyrgyz Republic (6)	Tajikistan (7)	Turkmenistan (8)	Uzbekistan (9)	Mongolia (10)	Pakistan (11)
Income source											
• Agriculture	-0.0029	-0.318**	0.101	0.021	-0.276	0.251*	0.012	0.081	-0.166	-0.336	-0.070
	(0.049)	(0.154)	(0.176)	(0.165)	(0.218)	(0.149)	(0.145)	(0.136)	(0.163)	(0.291)	(0.173)
• Wage	0.298***	0.303*	-0.573***	0.477**	0.704***	0.424***	0.218	0.097	0.261	1.239***	0.530*
	(0.053)	(0.164)	(0.150)	(0.218)	(0.209)	(0.147)	(0.172)	(0.141)	(0.190)	(0.204)	(0.275)
• Business	-0.045	0.398***	-0.202	-0.197	-0.200	0.064	-0.392***	0.020	-0.641***	0.762***	-0.198
	(0.049)	(0.149)	(0.166)	(0.172)	(0.178)	(0.144)	(0.140)	(0.238)	(0.154)	(0.211)	(0.185)
Rural	-0.097**	-0.392**	-0.114	0.313*	0.149	-0.136	-0.048	-0.132	-0.042	-0.642***	-0.230
	(0.047)	(0.160)	(0.176)	(0.163)	(0.147)	(0.149)	(0.153)	(0.131)	(0.152)	(0.244)	(0.170)
Constant	0.713***	3.362***	-0.198	-0.878	-0.313	-0.182	-0.088	0.379	0.623	0.091	1.087**
	(0.130)	(0.397)	(0.705)	(0.536)	(0.548)	(0.357)	(0.357)	(0.435)	(0.441)	(0.478)	(0.459)
Observations	10,252	1,064	1,000	1,024	1,066	1,024	1,011	1,000	1,001	1,006	1,056

HH = household, SEC = socioeconomic class.

Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: Authors.

points less likely to experience an income decline than those who have a lower qualification than a high school diploma (i.e., secondary school and below). The figure for those who have a higher education level than high school is 27.6 percentage points. This result is consistent with that among ASEAN households (Morgan and Trinh 2021). Similar to the case of ASEAN households, the role of a household head's education level is not observed in all countries in our sample. For example, in Afghanistan, households headed by someone with a higher education level have a much higher likelihood of experiencing an income decline than those with a lower education level. The same situation is also observed in the Kyrgyz Republic and in Mongolia, but only for households whose household head has a higher education level than high school. We do not observe the relationship between household head education and the likelihood of income decline in other countries.

Our results also suggest that female-headed households are less likely to experience a decline in income than their male counterparts. However, the results also vary by country. For example, we only observed a negative relationship in three countries (Georgia, Uzbekistan, and Mongolia), while there is a positive relationship in Turkmenistan and no relationship in other countries.

Similar to the case of ASEAN households, being located in a lockdown area on average increases the likelihood of experiencing an income decline. This is also observed in most countries, except for Afghanistan, Turkmenistan, and Pakistan. While living in a lockdown area does not have an effect on the likelihood of experiencing an income decline in Turkmenistan and Pakistan, it reduces the likelihood of income decline in Afghanistan. This finding is rather different from other countries. According to Morgan and Trinh (2021), this negative relationship could be because those living in lockdown areas receive a subsidy from the government to enable them to keep their income stable.

Households in rural areas were also less likely to experience income declines, but this relationship is only observed in two countries (Afghanistan and Mongolia). Meanwhile we find that Georgian rural households were more likely to suffer income declines than their urban counterparts.

7.5.2 Determinants of Having Expenditure Increase Due to the COVID-19 Pandemic

Half of the households in our sample reported that their expenditure increased (Figure 7.16). Only 16% reported that their expenditure declined, which was much lower than the 45% of households that experienced a decline in income (Figure 7.12).

Figure 7.16: Changes in Household Expenditure
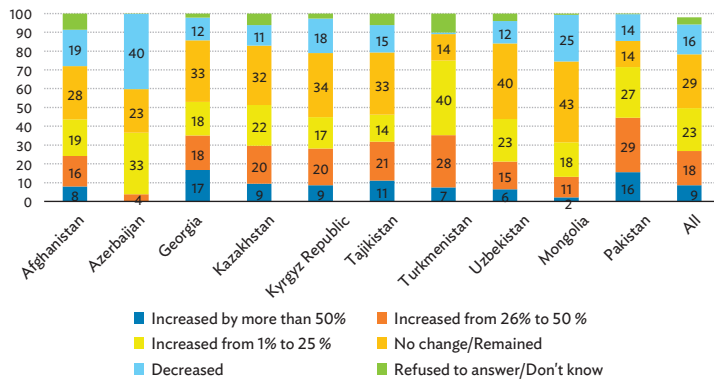
Source: Authors' calculation based on ADBI's database.

We examine the effects of the COVID-19 pandemic on household expenditure using the following equation:

$$Exp_i = \alpha_0 + \alpha_1\,SEC_i + \alpha_2\,HH_i + \alpha_3\,COVID_i + \epsilon_i, \qquad (2)$$

in which Exp_i is a dummy variable that takes the value of one if household i experienced an increase in expenditure during the COVID-19 period; SEC_i, HH_i, and $COVID_i$ are similar to equation (1); and ϵ_i is the error term. As before, we estimate the above equations for pooled data of 11 countries (with country dummy being controlled) and separately for each country.

Table 7.4 presents our estimation results. We find that on average, only the richest households experienced an increase in expenditure. More specifically, the likelihood of having an expenditure increase among the richest households was 14.5 percentage points higher than that of the poorest households (SEC 1, our reference group), while the likelihood of having an expenditure increase was not different among other SEC groups. However, in five countries, namely Azerbaijan, Georgia, the Kyrgyz Republic, Mongolia, and Pakistan, we did not find any difference among households across SEC groups. In other countries, richer households (either in SEC 3 or SEC 4) were more likely to have expenditure increases than poorer households (either in SEC 1 or SEC 2), except for the case of Turkmenistan. Our results show that

Table 7.4: Determinants of Experiencing an Expenditure Increase Due to the COVID-19 Pandemic

Variable	All (1)	Afghanistan (2)	Azerbaijan (3)	Georgia (4)	Kazakhstan (5)	Kyrgyz Republic (6)	Tajikistan (7)	Turkmenistan (8)	Uzbekistan (9)	Mongolia (10)	Pakistan (11)
HH head female	-0.0875	-0.149	0.361*	-0.145	-0.0218	0.0597	-0.326*	0.00392	-0.253	-0.422**	0.293
	(0.0540)	(0.383)	(0.194)	(0.133)	(0.128)	(0.153)	(0.172)	(0.252)	(0.192)	(0.173)	(0.252)
HH head education											
• Below high school education	-0.00495***	-0.0186***	-0.00223	-0.00665	-0.00300	-0.00313	-0.00672	0.00714	-0.00635	-0.000733	8.18e-05
	(0.00150)	(0.00496)	(0.00615)	(0.00462)	(0.00494)	(0.00518)	(0.00439)	(0.00615)	(0.00504)	(0.00550)	(0.00422)
• High school education	-0.0980	-0.0588	0.785	-0.349	-0.374	-0.399*	-0.0634	0.109	-0.0800	0.173	0.0185
	(0.0703)	(0.185)	(0.800)	(0.359)	(0.387)	(0.239)	(0.230)	(0.253)	(0.358)	(0.188)	(0.183)
• Above high school education	0.108	0.225	1.330*	-0.0452	0.00486	-0.233	0.0980	-0.0791	-0.00123	0.298	-0.324*
	(0.0683)	(0.156)	(0.795)	(0.345)	(0.374)	(0.235)	(0.226)	(0.242)	(0.341)	(0.199)	(0.183)
Located in lockdown area	-0.166***	-1.043***	0.578**	0.0494	-0.278*	-0.539***	0.129		-0.160		0.0675
	(0.0559)	(0.200)	(0.227)	(0.130)	(0.153)	(0.151)	(0.131)		(0.189)		(0.230)
Income group (base: SEC 1 poorer)											
• SEC 2	0.0185	0.0790	0.330	0.140	0.265	0.152	-0.366**	-0.368	-0.0222	-0.0220	-0.103
	(0.0618)	(0.176)	(0.240)	(0.206)	(0.217)	(0.188)	(0.178)	(0.288)	(0.194)	(0.187)	(0.234)
• SEC 3	0.000358	0.422**	-0.244	0.174	0.313	0.0502	-0.228	-0.670**	0.239	-0.162	-0.209
	(0.0649)	(0.190)	(0.250)	(0.225)	(0.219)	(0.195)	(0.180)	(0.283)	(0.200)	(0.253)	(0.221)
• SEC 4 (richer)	0.145**	-0.00737	0.255	0.265	0.465**	0.203	0.0673	-0.512*	0.443**	-0.0240	0.00314
	(0.0621)	(0.244)	(0.228)	(0.208)	(0.198)	(0.198)	(0.195)	(0.280)	(0.188)	(0.208)	(0.196)
Income source	-0.00139	-0.327**	0.0609	-0.108	0.0403	0.112					

Table 7.4 *continued*

Variable	All (1)	Afghanistan (2)	Azerbaijan (3)	Georgia (4)	Kazakhstan (5)	Kyrgyz Republic (6)	Tajikistan (7)	Turkmenistan (8)	Uzbekistan (9)	Mongolia (10)	Pakistan (11)
• Agriculture	-0.0159	0.462***	-0.858***	-0.219	-0.0761	-0.0128	-0.0740	-0.175	0.275*	0.199	-0.0456
	(0.0476)	(0.153)	(0.183)	(0.150)	(0.197)	(0.147)	(0.142)	(0.153)	(0.151)	(0.215)	(0.151)
• Wage	0.0926**	-0.126	0.147	0.0516	0.138	0.255*	0.0720	0.158	0.298	0.116	-0.0307
	(0.0519)	(0.156)	(0.156)	(0.209)	(0.203)	(0.147)	(0.169)	(0.161)	(0.182)	(0.180)	(0.208)
• Business	-0.0442	-0.163	0.0697	-0.120	-0.00117	-0.206	0.175	-0.245	0.410***	0.0452	-0.197
	(0.0466)	(0.145)	(0.179)	(0.154)	(0.168)	(0.143)	(0.136)	(0.288)	(0.149)	(0.169)	(0.161)
Rural	0.0237	1.408***	-2.062**	0.554	-0.0998	0.152	-0.112	-0.194	-0.0148	0.144	-0.0638
	(0.0456)	(0.153)	(0.186)	(0.143)	(0.135)	(0.147)	(0.150)	(0.149)	(0.142)	(0.183)	(0.146)
Constant	-0.00139	-0.327**	0.0609	-0.108	0.0403	0.112	0.277	1.645***	-0.473	-0.917**	1.139***
	(0.126)	(0.328)	(0.877)	(0.471)	(0.503)	(0.353)	(0.349)	(0.514)	(0.425)	(0.378)	(0.391)
Observations	10,252	1,064	1,000	1,024	1,066	1,024	1,011	996	1,001	1,006	1,056

HH = household, SEC = socioeconomic class.
Note: Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.
Source: Authors.

richer households (SECs 3 and 4) in Turkmenistan were less likely to experience an expenditure increase than poorer households (SECs 1 and 2).

With regard to sources of income, our results show that, on average, households with income from household businesses or self-employment were more likely to increase their expenditure than households that did not have such income. Meanwhile, there is no difference for households with agricultural or wage income from the reference group. The effect of income sources on household expenditure also differs by country. For example, while Afghan households with income from agriculture are less likely to experience an increase in expenditure than households without such a source of income, their Uzbekistani counterparts are more likely to have higher expenditure.

Our results also show that on average, education level and gender of household head have not affected the changes in household expenditure during the pandemic. The evidence also suggests that households located in a lockdown area have tended to experience an expenditure decline during the pandemic.

7.5.3 Determinants of Having Financial Difficulty

Financial difficulty is defined as a lack of financial resources for at least a week. About 76% of households in our sample reported that they had experienced financial difficulties (Figure 7.17). However, the share of households that reported financial difficulties varies across countries from 40% in Azerbaijan to 96% in Afghanistan. In nearly all countries, with Azerbaijan being the exception, more than half of the households reported financial difficulties. Nearly all (above 80%) households reported financial difficulties in Kazakhstan (81%), Pakistan (84%), Turkmenistan (93%), Georgia (92%), and Afghanistan (96%). These numbers are higher than in Southeast Asia (SEA) (Morgan and Trinh 2021), which means that a larger proportion of households reported financial difficulties in CAREC than in SEA. In SEA, there are five countries where more than half of the households did not report financial difficulties (Cambodia, the Lao PDR, Malaysia, Myanmar, and Viet Nam) in 2020. Also, in SEA there were only two countries where nearly all households (above 80%) reported financial difficulties (Indonesia at 84% and the Philippines at 85%).

Figure 7.17: Households Experiencing Financial Difficulty during the Pandemic
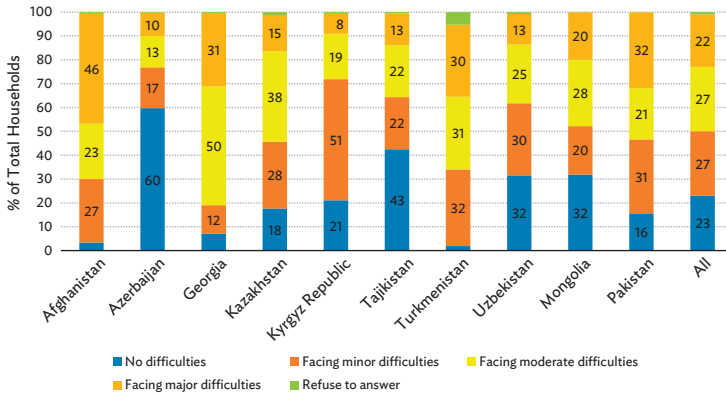
Source: Authors' calculation based on ADBI's database.

This section examines which households are more likely to be financially vulnerable to the pandemic (or any expected shocks) than others. Following Morgan and Trinh (2021), we estimate the following equation:

$$FinDiff_i = \beta_0 + \beta_1 SEC_i + \beta_2 HH_i + \beta_3 COVID_i + \eta_i, \qquad (3)$$

in which $FinDiff_i$ is a dummy variable that takes the value of one if household i experienced financial difficulties (which is defined as a lack of financial resources for daily expenditure if all the income sources disappear for a week) during the COVID-19 period; SEC_i, HH_i, and $COVID_i$ are similar to equation (1); and η_i is the error term. As before, we estimate the above equations for pooled data of 11 countries (with country dummy being controlled) and separately for each country.

Table 7.5 presents our estimation results. We found that, on average, households in the lowest socioeconomic class (i.e., the poorest group) had a higher likelihood of getting into financial difficulty than households in the highest socioeconomic class (i.e., the richest group) by about 94.6 percentage points. This is consistent with the results Morgan and Trinh (2021) found among ASEAN countries. However, we also find a wide difference across countries. In Afghanistan, Georgia, and Tajikistan, there was no difference across households in different SECs, while in

Table 7.5: Determinants of Financial Difficulties Due to the COVID-19 Pandemic

Variable	All (1)	Afghanistan (2)	Azerbaijan (3)	Georgia (4)	Kazakhstan (5)	Kyrgyz Republic (6)	Tajikistan (7)	Turkmenistan (8)	Uzbekistan (9)	Mongolia (10)	Pakistan (11)
HH head female	0.0944		-0.167	-0.00370	0.0911	0.670***	0.0567	0.572	-0.0261	0.0348	0.407
	(0.0666)		(0.232)	(0.253)	(0.164)	(0.211)	(0.173)	(0.682)	(0.202)	(0.173)	(0.341)
HH head education											
• Below high school education	-0.0118***	0.00388	-0.00991	-0.0173**	-0.00147	-0.00282	-0.00171	0.0136	-0.0135**	-0.0324***	-0.0171***
	(0.00186)	(0.0119)	(0.00706)	(0.00879)	(0.00629)	(0.00627)	(0.00439)	(0.0156)	(0.00532)	(0.00592)	(0.00510)
• High school education	0.0735	-0.815	-1.241	0.706	0.221	0.0223	0.286	-0.380	-0.231	0.285	-0.124
	(0.0904)	(0.499)	(0.826)	(0.550)	(0.470)	(0.294)	(0.230)	(0.650)	(0.403)	(0.188)	(0.230)
• Above high school education	0.122	-0.529	-0.900	0.883*	0.498	-0.0635	0.306	-0.769	-0.153	0.249	-0.531**
	(0.0893)	(0.473)	(0.823)	(0.520)	(0.454)	(0.290)	(0.226)	(0.644)	(0.387)	(0.199)	(0.224)
Located in lockdown area	0.138*	-0.262	-0.451*	0.263	-0.120	0.0704	0.355***	-0.0663	0.328		0.430*
	(0.0706)	(0.652)	(0.249)	(0.252)	(0.191)	(0.182)	(0.132)	(2.197)	(0.208)		(0.256)
Income group (base: SEC 1 poorer)											
• SEC 2	-0.193**	0.949	-2.219***	-0.151	0.110	-0.209	0.0808	-1.106	-0.207	0.138	0.706*
	(0.0808)	(0.728)	(0.340)	(0.416)	(0.313)	(0.251)	(0.180)	(0.817)	(0.210)	(0.196)	(0.364)
• SEC 3	-0.442***	-0.725	-2.318***	-0.0990	-0.493*	-0.677***	-0.179	-1.129	-0.338	-0.167	0.156
	(0.0837)	(0.612)	(0.341)	(0.464)	(0.295)	(0.247)	(0.182)	(0.825)	(0.219)	(0.266)	(0.305)
• SEC 4 (richer)	-0.946***	-2.192***	-4.459***	-0.539	-0.570**	-0.842***	-0.163	0.375	-0.673***	-0.442**	-0.536**
	(0.0785)	(0.592)	(0.353)	(0.410)	(0.272)	(0.248)	(0.198)	(0.850)	(0.203)	(0.223)	(0.242)

Table 7.5 *continued*

Variable	All (1)	Afghanistan (2)	Azerbaijan (3)	Georgia (4)	Kazakhstan (5)	Kyrgyz Republic (6)	Tajikistan (7)	Turkmenistan (8)	Uzbekistan (9)	Mongolia (10)	Pakistan (11)
Income source											
• Agriculture	-0.0567	-0.152	0.260	-0.327	0.0217	-0.269	-0.238*	1.295***	-0.226	-0.224	-0.267
	(0.0600)	(0.407)	(0.204)	(0.269)	(0.256)	(0.176)	(0.142)	(0.420)	(0.158)	(0.222)	(0.186)
• Wage	0.0857	-0.890**	0.128	0.0275	0.252	0.105	0.150	0.387	-0.175	1.036***	-0.0837
	(0.0645)	(0.376)	(0.180)	(0.390)	(0.270)	(0.174)	(0.172)	(0.431)	(0.191)	(0.224)	(0.246)
• Business	0.232***	0.527	0.0816	-0.151	-0.388*	0.112	-0.233*	4.778***	-0.489***	0.306*	0.171
	(0.0576)	(0.374)	(0.203)	(0.296)	(0.234)	(0.173)	(0.138)	(0.402)	(0.162)	(0.182)	(0.197)
Rural	-0.109*	1.275***	-0.111	-0.0455	0.173	-0.241	-0.380**	-0.321	-0.298**	-0.612***	-0.129
	(0.0577)	(0.365)	(0.209)	(0.277)	(0.174)	(0.182)	(0.154)	(0.379)	(0.151)	(0.187)	(0.185)
Constant	3.730***	3.678***	4.096***	3.074***	1.681***	1.938***	0.423	-0.545	2.442***	2.257***	2.455***
	(0.210)	(0.943)	(0.956)	(0.824)	(0.638)	(0.442)	(0.352)	(1.233)	(0.483)	(0.406)	(0.480)
Observations	10,252	1,031	1,000	1,024	1,066	1,024	1,011	1,000	1,001	1,006	1,056

HH = household, SEC = socioeconomic class.
Note: Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.
Source: Authors.

Uzbekistan, Mongolia, and Pakistan, only households in the richest group were less likely to have financial difficulty than the poorest group, while households in other SEC groups were not different. Meanwhile in Kazakhstan and the Kyrgyz Republic the two upper income groups were less likely to have financial difficulty. Only in Azerbaijan did we find that all three richer household groups were less likely to suffer from financial difficulty.

We also find some evidence on the effects of income sources on the likelihood of getting into financial difficulty. On average, households receiving income from household businesses and/or self-employment were more likely to suffer from financial difficulty, while there is no difference between households with and without income from agricultural production and from wages. This may be due to the fact that households with income from household businesses tend to experience an increase in expenditure (as shown in Table 7.4). As with other results, we also find a large difference across countries. For example, households in Turkmenistan with income from agricultural production were more likely to experience financial difficulty, while their counterparts in Tajikistan were less likely to do so. Similarly, households in Afghanistan with income from wages are less likely to have financial difficulty than those without this source of income, but in Mongolia, these households are more likely to have financial difficulties. Different patterns were also found across households with income from household businesses across countries.

Our empirical results show that the education level of the household head on average was not associated with the likelihood of getting into financial difficulties. This result is different from that found in ASEAN economies where household heads with a higher education level were less likely to experience financial difficulty. We find a negative relationship between education and the likelihood of getting into financial difficulty in Pakistan, while in Georgia the relationship was positive, i.e., households whose heads have an education level higher than high school were more likely to experience financial difficulties.

The estimation results also suggest that being located in a lockdown area increased the likelihood of getting into financial difficulty on average. But the effects seem to be weak and differ by country. Only in Tajikistan and Pakistan did we find a positive relationship between living in lockdown areas and the likelihood of getting into financial difficulties, while the relationship is negative in Azerbaijan and there is no relationship between the two variables in other countries. We also find that rural households are less likely to experience financial difficulty, but this relationship is only statistically significant at the 10% level. This variable is only statistically significant in four countries.

Rural households in Tajikistan, Uzbekistan, and Mongolia were less likely to have financial difficulties than their urban counterparts, but in Afghanistan urban households were less likely to experience financial difficulty than rural households were.

7.6 Concluding Remarks

The impacts of the COVID-19 outbreak have heavily affected the CAREC member countries, which are Afghanistan, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, the PRC, Tajikistan, Turkmenistan, and Uzbekistan. The COVID-19 crisis and the resulting falls in demand due both to uncertainty and policy measures such as lockdowns, social distancing, and travel restrictions are having a severe impact on CAREC countries. In order to better understand these impacts, computer-assisted telephone interviews of households were conducted in 10 countries from the CAREC region (excluding the PRC) over the period May–August 2021. The samples were representative of the income classes and the rural and urban population in each country.

Using empirical methods, this chapter has examined the determinants of the impact of COVID-19 on (i) income decline, (ii) expenditure increase, and (iii) financial difficulty. Our results are mostly consistent with results on ASEAN by Morgan and Trinh (2021), but some differences exist due to differences in the structures of the economies. We provide results for all countries together and for each country. The results also vary across countries. The chapter has provided several interesting results.

Overall, the COVID-19 pandemic has affected the income of households regardless of their economic status. Nearly half of households (45%) reported income declines. The share of households with income declines ranged widely among CAREC countries from 80% of households (Pakistan) to 20% of households (Mongolia). Among households with a declining income, the largest share (17.3%) reported that their income had fallen by 1%–25%, while 15.9% reported that their income had declined by 26%–50%, and 12.3% of households reported an income decline of over 50%. On average, households with income from wages tended to experience a decline in income compared to other sources of income like agricultural production, business, and self-employment. Households with less educated household heads were more likely to experience income declines due to COVID-19. Female-headed households were less likely to experience a decline in income due to COVID-19. Households located in a lockdown area on average had an increased likelihood of experiencing an income decline. Households in rural areas were less likely to experience an income decline, but

this relationship is only observed in two countries (Afghanistan and Mongolia), while Georgian rural households were more likely to experience an income decline than their urban counterparts.

On average, only the richer household income groups (SEC 4) experienced an increase in expenditure. With regard to sources of income, on average, households with income from household businesses or self-employment were more likely to increase their expenditure than households that did not have such sources of income. Households located in lockdown areas tended to experience expenditure declines during the pandemic.

Households in the lowest socioeconomic class, SEC 1 (i.e., the poorest group), were more likely to get into financial difficulty than those households in the highest socioeconomic class. On average, households with income from household businesses and/or self-employment were more likely to suffer from financial difficulty while there was no difference between households with and without income from agricultural production and from wages. Being located in a lockdown area increased the likelihood of getting into financial difficulty on average. But the effects seem to be weak and vary by country. More households reported financial difficulties in CAREC than in ASEAN.

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Appendix 7.1: Databases of COVID-19 Policy Responses and Measures by International Organizations

A number of international organizations have produced a database of COVID-19 policies and measures from many countries including CAREC member countries (Table A7.1).

Table A7.1: Databases of COVID-19 Policy Responses and Measures by International Organizations

Organization	Database Title	Link
Asian Development Bank	ADB COVID-19 Policy Database	https://covid19policy.adb.org/
International Monetary Fund	Policy Responses to COVID-19	https://www.imf.org/en/Topics/imf-and -covid19/Policy-Responses-to-COVID-19
United Nations World Tourism Organization	COVID-19: Measures to Support Travel and Tourism	https://www.unwto.org/covid-19-measures -to-support-travel-tourism
World Trade Organization	COVID-19: Measures Affecting Trade in Services	https://www.wto.org/english/tratop_e /covid19_e/trade_related_services _measure_e.htm
	COVID-19: Measures Affecting Trade in Goods	https://www.wto.org/english/tratop_e /covid19_e/trade_related_goods _measure_e.htm
World Bank	COVID-19 Trade Policy Database: Food and Medical Products	https://www.worldbank.org/en/topic/trade /brief/coronavirus-covid-19-trade-policy -database-food-and-medical-products
International Monetary Fund	Policy Responses to COVID-19	https://www.imf.org/en/Topics/imf-and -covid19/Policy-Responses-to-COVID-19

Appendix 7.2: Income Groups

Since different countries have different numbers of SECs, in our empirical analyses we recategorized the SECs into four groups to make them consistent across countries (Table A7.2). More specifically, we regrouped SEC 5 and SEC 6 into SEC 4 in Kazakhstan, and SEC 5 into SEC 4 in Afghanistan, Azerbaijan, Georgia, Mongolia, Pakistan, Tajikistan, and Turkmenistan.

Table A7.2: Income Levels in Local Currency for Each Country

Under which of the following ranges does your average monthly household income from June 2020 to December 2020 fall?

Original SEC	Revised SEC	Afghanistan, afghani	Azerbaijan, Azerbaijan manat	Georgia, lari	Kazakhstan, tenge	Kyrgyz Republic, som	Mongolia, togrog	Pakistan, Pakistan rupee	Tajikistan, somoni	Turkmenistan, Turkmen manat	Uzbekistan, sum
SEC 1	SEC 1	≤5,000	≤820	≤299	≤60,000	≤6,000	≤500,000	≤5,000	≤800	≤1,000	≤1,200,000
SEC 2	SEC 2	5,001–15,000	820.1–1,035.0	300–599	60,001–100,000	6,001–12,000	500,001–900,000	5,001–15,000	801–1,400	1,001–1,500	1,200,001–2,000,000
SEC 3	SEC 3	15,001–30,000	1,035.1–1,240.0	600–999	100,001–150,000	12,001–20,000	900,001–1,100,000	15,001–30,000	1,401–2,400	1,501–1,800	2,000,001–3,200,000
SEC 4	SEC 4	30,001–60,000	1,240.1–1650.0	1,000–1,499	150,001–250,000	> 20,000	1,100,001–2,100,000	30,001–60,000	> 2,400	1,801–2,500	> 3,200,000
SEC 5		> 60,000	> 1,650.1	≥1,500	250,001–300,000		≥2,100,001	> 60,000		≥2,501	
SEC 6					> 300,000						

SEC = socioeconomic class.

Source: Authors' calculation based on ADBI's database.

8

The Impact of COVID-19 on the Sustainable Development of Central Asian Cities: The Case of Informal Kabul

Madina Junussova and Saniya Soltybayeva

8.1 Introduction

Since the adoption of the Sustainable Development Goals (SDGs) in 2015, the 17 interconnected goals have served as a comprehensive theoretical framework to guide the national economic development of the United Nations (UN) member states. However, most countries continue to treat the SDGs as sector-specific individual goals and overlook their interdependencies. Central governments push the need to achieve the SDGs on the national level, ignoring their detailed projections at the local level, considering different urban and rural areas. The results of recent studies show that long-term strategic investment in infrastructure is more efficient when planners apply an integrated approach to using the SDGs for local development (Nilsson, Griggs, and Visbeck 2016; Pradhan et al. 2017). Therefore, the SDGs' achievement in the Central Asia Regional Economic Cooperation (CAREC) region requires an integrated approach and careful attention to understanding the local conditions for development. As suggested by scholars, governments should pay special attention to close connections between SDGs such as Goal 6 (to ensure availability and sustainable management of water and sanitation for all) and Goal 11 (make cities and human settlements inclusive, safe, resilient, and sustainable) (Parikh, Parikh, and McRobie 2013).

Globally, 2.2 million people lack access to clean drinking water, and 4.2 billion people do not have properly managed sanitation services (Cooper 2020). Water quality is decreasing due to unmanaged direct discharges from industry, agriculture, and human waste. The

rapid growth of the world population and global climate change lead to increasing water demand and water shortages (UN-Water 2019). Climate change will increase dry seasons and flooding and accelerate epidemics because of the fast spread of a wide range of diseases (UNEP 2016). The lack of access to clean drinking water and urban sanitation services negatively impacts public health (Satterthwaite et al. 2019). One of the critical activities of the CAREC Institute is the promotion of cooperation and partnership among Central Asian countries through knowledge generation and sharing to contribute to sustainable development, including sustainable urbanization. At the beginning of the coronavirus disease (COVID-19) pandemic, CAREC researched the status of water, sanitation, and hygiene (WASH) in four CAREC countries, namely the People's Republic of China, Mongolia, Tajikistan, and Uzbekistan (CAREC Institute 2021). The CAREC study added a unique value to enhancing the WASH management in urban areas of these Central Asian countries.

By focusing on the case of Afghanistan's capital city of Kabul, this chapter contributes to the CAREC WASH studies by filling the current literature gap on the impact of COVID-19 on the sustainable development of cities in the CAREC region. However, different from other WASH studies, the chapter analyzes the COVID-19 implications for Kabul, focusing on achieving interlinked SDGs bringing together the three critical components of sustainable and healthy urban living such as good health and well-being (Goal 3), clean water and sanitation (Goal 6) and sustainable cities and communities (Goal 11). The chapter summarizes the key findings from a pilot study conducted during September–December 2020, intending to understand how the COVID-19 pandemic affected the urban poor living in Kabul. The chapter starts by discussing the pre-COVID-19 measures introduced by the government to improve Kabul's informal settlements. The next section highlights the critical impacts of the COVID-19 pandemic on Kabul residents. The chapter concludes by proposing sustainable solutions to improve living conditions in informal settlements. We call for the need to use locally envisioned solutions and socially just responses suitable for Kabul's informal settlements by supporting community-based innovative actions to improve the living conditions of the urban poor in the long run.

8.2 Literature Review

In 2020, COVID-19 became an important sustainability test for urban development around the world. Due to a complex combination of urban development challenges such as high population density and pressure from newcomers, cities have experienced higher rates of infection and

death than other settlement types (Dixon 2020). Cities with people living in informal settlements and lacking basic infrastructure have become the main epicenters of the COVID-19 pandemic (Muggah and Florida 2020). The COVID-19 pandemic forced many people worldwide to stay at home, whereas sitting at home for residents of the densely populated informal settlements has become a challenge to survive in an extreme environment (Cosgrove 2020).

Approximately 1 billion people live in informal settlements with poor sanitary conditions that allow the fast transmission of viruses and infections. Informal settlements are areas of unplanned and unauthorized housing without adequate essential services (UN-Habitat 2015). Often, informal settlements lack access to necessary urban infrastructures such as safe water and clean toilets, and the residents live in poverty with no or weak land rights (Niebergall, Loew, and Mauser 2008). Despite their apparent vulnerability, residents of informal settlements remain invisible. Governments do not register or document these people, while scholars do not pay enough attention to challenges met by poor people combating COVID-19 in informal settlements (Wilkinson 2020a).

The COVID-19 crisis returned researchers' attention to the importance of achieving sustainable development. Scholars approach the pandemic not only as a challenge but also as an opportunity to come up with new post-COVID-19 strategies to achieve sustainable urban development (Barbier and Burgess 2020; Pisano 2020). There are also studies assessing the impact of COVID-19 on achievement of the SDGs (Conceição et al. 2020; Fagbemi 2021; Yamada and Kato 2020; Olsen et al. 2021). A growing number of studies measure the impact of COVID-19, focusing on its consequences (Leal Filho et al. 2020). At the same time, several researchers analyze the social and economic impact of COVID-19 in developing countries (Ahadu 2020; Bruckner and Mollerus 2020; Djankov and Panizza 2020; ILO 2020; IMF 2020; OECD 2020; Stronski 2020; UNCTAD 2020; World Bank 2020) including Central Asian countries (OECD 2020; Stronski 2020). Some of them concentrate on the effect of the COVID-19 pandemic on informal settlements, mainly in African and South American countries (Austrian et al. 2020; Duque Franco et al. 2020; Gibson and Rush 2020; Nyashanu, Simbanegavi, and Gibson 2020; Quaife et al. 2020). However, there are no studies on the impact of COVID-19 on informal areas in CAREC cities from the perspective of the SDGs.
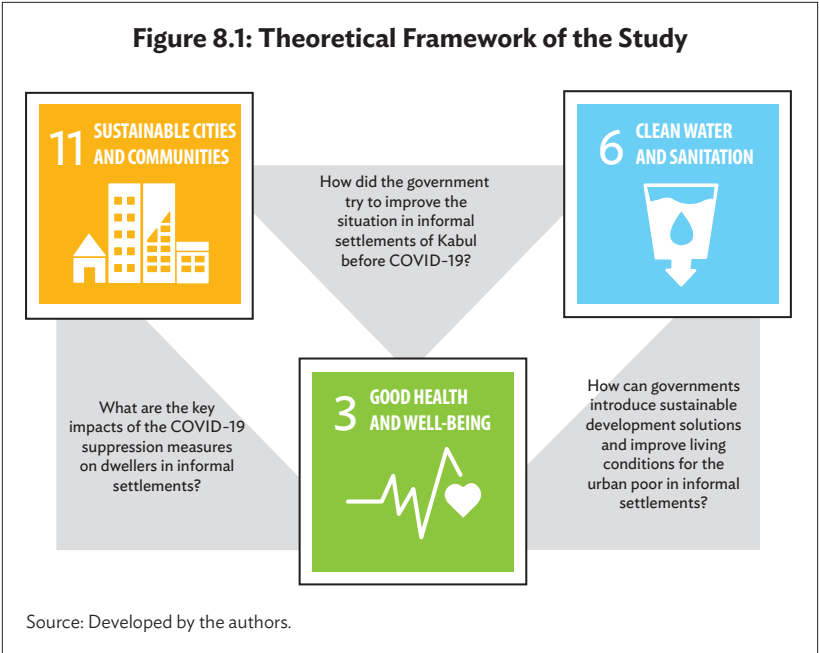
This chapter aims to fill the current literature gap by focusing on Kabul and studying how the COVID-19 impact may differ in informal settlements of Central Asia. The study analyzes the main challenges undermining the achievement of sustainable development in Kabul based on the adopted theoretical framework (Figure 8.1), putting together three SDGs. The study aims to fill the information gap about

people residing in informal settlements of Kabul by answering the following research questions:

- How did the government try to improve the situation in informal settlements of Kabul before COVID-19?
- What are the key impacts of the COVID-19 suppression measures on dwellers in informal settlements?
- How can governments introduce sustainable development solutions and improve living conditions for the urban poor in informal settlements?

We support bottom-up, socially just approaches in planning urban development based on working with urban dwellers and changing their behavior and attitudes (Wilkinson 2020b). We argue that instead of imposing rules from the top, forcing resettlement, and demolishing structures in which people invested money and time, it is more sustainable to do more to understand the current situation and to adopt a bottom-up perspective to find solutions to make all city districts habitable (Ndinda, Uzodike, and Winnaar 2011).

Figure 8.1: Theoretical Framework of the Study

11 SUSTAINABLE CITIES AND COMMUNITIES

How did the government try to improve the situation in informal settlements of Kabul before COVID-19?

6 CLEAN WATER AND SANITATION

What are the key impacts of the COVID-19 suppression measures on dwellers in informal settlements?

3 GOOD HEALTH AND WELL-BEING

How can governments introduce sustainable development solutions and improve living conditions for the urban poor in informal settlements?

Source: Developed by the authors.

8.3 Research Design

The study findings are based on the results of a desk study and key informant interviews (KIIs). The desk study included analysis of the relevant reports, government policies and programs, and scholarly papers. The number of KIIs depends on the data collection needs, available time, and resources (UCLA Center for Health Policy Research 2004). The primary purpose of the KII is to collect firsthand knowledge about the topic of interest (Better Evaluation 2014). For our study, it was essential to collect local data from people living in Kabul city and share their experience about the COVID-19 impact on residents living in informal settlements.

Internationally, Afghanistan is recognized as a fragile state, threatening the future development of almost all Central Asian countries. The recent actions of the Taliban taking control over the country in August 2021 are clear evidence of this fact (BBC News 2021). Data collection in fragile states is often affected by lack of security, interruptions in telecommunication services, and people's fear and resistance to answering questions on sensitive topics (Hoogeveen and Pape 2020). The conducted pilot study was not an exception. Initially, we planned to run KIIs with 20 respondents, but due to the restrictions related to COVID-19, eight people refused to participate in the study, so we completed only 12 KIIs with residents of Kabul (see Table 8.1).

However, as the KIIs served as a supplementary source of information to the desk study, the 12 KIIs were enough to develop informative findings. We were still able to cover a diverse mix of informants to ensure a variety of perspectives, including those of civil servants from national and local government (five people), workers in the public health sector (three people), friends and relatives of the residents of informal settlements (two people), and poor people living in informally occupied areas of Kabul (two people). The key criterion for selection was the readiness of respondents to share their unique personal knowledge about the COVID-19 impact. We did not seek a balance in terms of gender, age, or occupation as these factors did not affect the study results considerably. The respondents provided trustable information that our Afghan research assistants checked by contacting other people and organizations mentioned during the interviews and looking at additional sources of evidence to check orally submitted data in the local news.

Table 8.1: Study Participants

Participant No	Gender	Age Group	Affiliation	Other Details	Place of Residence	Online Interview Date
1	Male	35–40	Civil servant	National government	Kabul	December 2020
2	Male	41–44	Civil servant responsible for water management in urban areas	National government	Kabul	December 2020
3	Female	45–50	Civil servant responsible for urban development	National government	Kabul	December 2020
4	Male	45–50	Civil servant responsible for land use management	Municipal government	Kabul	December 2020
5	Male	30–34	Civil servant responsible for water management	Municipal government	Kabul	December 2020
6	Male	45–50	Doctor who treated patients living in an informal settlement	Public hospital	Kabul	December 2020
7	Male	20–24	Resident of Kabul whose relatives live in an informal settlement	Entrepreneur	Kabul	November 2020
8	Male	35–40	Resident of Kabul whose clients live in an informal settlement	Entrepreneur	Kabul	November 2020
9	Female	20–24	Nurse who treated patients living in an informal settlement	Public hospital	Kabul	November 2020
10	Male	45–50	Nurse who treated patients living in an informal settlement	Public hospital	Kabul	November 2020
11	Male	30–34	Resident of informal settlement	Shop owner	Kabul	November 2020
12	Female	41–44	Resident of informal settlement	Housewife	Kabul	November 2020

Source: Authors.

The KII questions were developed based on the preliminary review of similar studies and piloted by engagement of the authors' colleagues living in Kabul (see Appendix 8.1). The respondents were identified and selected based on local colleagues' recommendations using their unique knowledge of the current situation in informal settlements in Kabul. The KIIs were conducted in November–December 2020 via the online means of communication selected by respondents. We called respondents using WhatsApp, Telegram, Zoom, and Skype. Our Afghan research assistants helped us select key informants, scheduled and set up the online meetings, and used their cell phones to connect us with key informants during online interviews and interpreted the conversations. All respondents provided oral informed consent and

preferred to remain anonymous. They did not want to have their names published due to the prevailing fear of an attack by anyone who did not like what they said or did not share their opinion. The respondents were granted the opportunity to withdraw from the interview at any time without providing a reason. However, none of them used it, and all planned interviews were completed.

8.4 The Case of Kabul

Kabul, Afghanistan's capital city, is one of Central and South Asia's largest cities, with roughly 6 million inhabitants and continuing to grow (Macrotrends.net 2020). Fueled by rural–urban migration, internal displacement, and refugees' return, urban growth has outpaced the city's capacity to maintain the essential infrastructure, services, and jobs for its residents (Chaturvedi, Kuffer, and Kohli 2020). The city has become one of the most attractive destinations for rural–urban migrants due to the safer urban environment and better employment opportunities (Hakim and Boz 2020). Since 2001, most foreign aid has been directed to Kabul or a few other urban centers, while rural areas where about three-quarters of Afghans live have been almost left behind. As a result, the rural–urban migration continues to grow along with the steady decline in agricultural production, which has been under-resourced due to a lack of prioritization (ATR Consulting 2018; Waldman 2008).

The influx of migrants coupled with mostly unplanned urban development resulted in the widespread emergence of informal settlements (Rezayee 2020). Informal settlements occupy considerable territories of Kabul, and approximately 70% of city residents live in such settlements. Recently, UN-Habitat identified 54 informal settlements in Kabul (Wilkinson 2020a). The highest share of informal settlements is concentrated in the city's southwest (Nazire et al. 2016). The population of these informal settlements comprises urban poor, rural migrants, returned refugees, and other people displaced by conflicts or disasters (Gebremedhin 2005).

Living in informal settlements is associated with a high level of uncertainty due to weak land rights and vulnerability to natural disasters and pandemics. In many cases, informal housing residents become victims of land speculators or illegal real estate agents (Rezayee, Ling, and Misnan 2019). Residents purchase land receiving customary deeds (*urfee*), and they do not recognize that this kind of contract makes their residence informal (Gaston and Dang 2015). Therefore, informal settlement residents refuse to waive their rights over the purchased land and have built houses regardless of the illegal status from the government's perspective. The lack of adequate land use management,

absence of land registry, and the widespread corruption in land deals make poor people victims of land conflicts and land tenure insecurity (Alden Wily 2003).

Informal settlements are highly vulnerable to natural disasters because of their location on a high seismic hazard zone, poor housing quality, and high population density. The majority of Kabul's informal housing plots do not fulfill the earthquake safety standards (Barbé 2013). There is a difference between informal housing depending whether it is located on flat or hilly parts of the city. Informal housing on flat areas that used to be agricultural lands is characterized by fine quality of building materials and good design in terms of land use maximization, whereas informal housing on the slopes is built with handmade mud bricks with dwellings very close to each other (JICA 2009). In the flat areas, informal housing density is around 20–28 houses per hectare (Barbé 2013). On hills, the density is 10 times higher. The land plot size occupied by a house typically varies from 150 to 200 square meters (Collier, Manwaring, and Blake 2018).

Access to groundwater is one of the key challenges for the urban poor living in Kabul's informal settlements. In Kabul, with over 6 million people, more than 80% of urban residents lack adequate access to potable water (Glinski 2019). Surface water is primarily taken straight from the source by buckets, distributed by tankers, or delivered through an existing water distribution network (Davis and Lambert 1995; Holtermann, Gaull, and Lucas 1998). Groundwater is the main source of water in Kabul with about 70% of the urban population relying on it (Hashimi 2017). The estimated groundwater availability in Kabul is approximately 44 million cubic meters per year, enough to supply only 2 million inhabitants at the modest per capita consumption of 50 liters per day (Saffi 2011). Due to the growing population, the demand for water for drinking and irrigation will continue to evolve, increasing dependence on groundwater and alternative sources, including wastewater (WHO 2019).

The centralized water supply system is underdeveloped in Kabul and residents drill wells for private access to groundwater. Wells are usually hand-dug or drilled and extracted through hand pumps or electric submersible pumps (interviews with Kabul residents, November 2020). Getting access to groundwater is not regulated by the government, and people do not pay any fee for using groundwater as a source. The continuous private extractions of groundwater by a growing number of residents have led to a decreased groundwater level due to a negative balance between natural recharge and unregulated extraction. According to the United States Geological Survey, which monitored the groundwater levels from 2004–2012, the water levels had continuously

fallen by 1.5 meters per year (Water Politics 2018). The increased depth of groundwater makes it less accessible for poor people who cannot dig deeper wells. The steady decline in groundwater signals that it may be fully exhausted and Kabul residents will lose their main source for drinking water. According to recent predictions, all groundwater in Kabul will go dry in the next 10 years (Mehrdad 2018).

8.4.1 Pre-COVID-19 Measures to Improve the Situation in Informal Settlements of Kabul

Since 2002, Afghanistan has made several unsuccessful attempts to address the challenge of Kabul's informal settlements. The government measures included actions to guarantee tenure security, land readjustment, urban redevelopment, and settlement upgrading (Rezayee et al. 2019). Nevertheless, the government's actions to change Kabul's situation in informal settlements from the top did not bring any considerable improvements. For example, during 2002–2012, the Ministry of Urban Development and Housing planned to implement 13 programs aiming to manage the settlement upgrading in Kabul in which donors had planned to build 19,747 apartments, but only 4,117 have been completed (French et al. 2019; Majale 2017).

There are many reasons why the government failed to implement the planned settlement improvement in Kabul. However, in most cases, there were poor coordination and inadequate distribution of roles and responsibilities among key actors involved in the implementation from the national and subnational levels and from independent government agencies. For example, central and local government actors responsible for infrastructure and services delivery did not always consider and follow the land allocation procedures. Simultaneously, the Afghanistan Independent Land Authority responsible for managing state lands countrywide did not have enough capacity to coordinate the actors' actions on the local level (Amiri 2018; Strategy Secretariat, Afghanistan National Development 2008).

Despite unsuccessful past attempts to change the situation from the top, Afghanistan's government continued to apply the centralized planning approach by supplying Kabul with urban development solutions from the top. The planning process does not include any key stakeholder engagement or public consultations (interviews with local civil servants, December 2020). Even the Kabul city authorities' participation in the planning occurs only at the latest stages when all development solutions have already been approved (interviews with local civil servants, December 2020). In 2011, Afghanistan, in cooperation with international partners, developed the Kabul City

Master Plan. The Master Plan included recommendations for upgrading informal settlements, but the proposed changes ignored local resources and capacities. Consequently, the government agencies responsible for implementation could not finance the planned upgrading and leverage adequate private sector investment for construction work. The assessment of informal areas of Afshar and Hothkhel districts in Kabul showed that upgrading interventions were limited to light, short-term physical upgrades without any considerable long-term improvements (Amiri 2018; Nazire et al. 2016).

The Kabul City Master Plan proposed the creation of Kabul New City in the Deh-e-Sabz district that, among other objectives, had to deal with the shortage of affordable formal housing. In September 2013, Kabul New City was planned to be implemented in three phases by 2025 (Dehsabz-Barikab City Development Authority). The first phase included housing provision for 400,000 residents, while the residential district's total estimated capacity is 1.5 million inhabitants. However, evidence shows that the Kabul New City project implementation is well behind schedule. By the beginning of 2020, the physical progress included a few kilometers of roads, a tiny portion of the infrastructure, and a limited number of commercial buildings (Hamidi 2020). The project delays were caused by the lack of sufficient technical and managerial capacity, challenges related to access to water and electricity supply, and disputes over land ownership.

In 2016, the government introduced the Urban National Priority Program for 2016–2025. This program proposes a combination of policy and regulatory tools and financial instruments to address housing affordability. The approach was mainly borrowed from other countries' practice in a one-size-fits-all approach. It includes a housing subsidy program, a cross-subsidization model for mixed-income housing, and non-collateralized lending. The government introduced these initiatives without clarifying how they will be implemented in the absence of a legal basis for people living in informal settlements. The national program Citizens' Charter in Cities prioritizes the in-situ upgrading of informal settlements through the "urban solidarity" model to enhance durable housing, social inclusion, and aspects of the neighborhood environment such as water, sanitation, streets, drainage, and parks (Ministry of Finance of Afghanistan 2016). The cost of the government's policy actions exceeds the volume of national revenue, making it another overambitious wish list to attract donors' financial assistance rather than feasible actions to achieve self-reliance and sustainability.

International development organizations are also working hard to change Kabul's situation by providing funds and technical assistance in housing-related infrastructure and services in informal settlements

in Kabul. In 2010, for the collaborative work of 15 UN agencies and nongovernment agencies, international development agencies set up the Kabul Informal Settlements Task Force initiative. The initiative helped coordinate members' interventions and optimized external resource allocation to Kabul's 52 informal settlements (Majale 2017). However, the donors' applied upgrading often is limited to unsustainable, short-term assistance to selected neighborhoods, and it does not add any substantial value to citywide long-term sustainable development. Residents and local authorities show a certain resistance to adopting externally introduced new practices because often they do not have enough capacity, knowledge, and resources to maintain the obtained service or infrastructure (interview with Kabul residents in November and with local civil servants in December 2020). Usually, people engaged in such projects immediately stop all activities after the completion of a project. Such residents' behavior may become a result of overdependence on unsustainable external support.

The development of urban infrastructure like water supply and sewage systems lags far behind the housing issue. The Ministry of Urban Development and Housing is responsible for regulating urban water and sewage issues. In 2005, the ministry developed the Urban Water Supply and Sewerage Sector Institutional Development Plan (Baheer and Koch 2007). The plan had to serve as a road map for the short-, medium- and long-term water sector development, including the creation of a special committee to guide the development of the Kabul sewerage system. However, it did not lead to any considerable improvements; for example, the planned comprehensive evaluation of the Kabul sewerage system was not fully implemented (Baheer and Koch 2007).

The Afghanistan Urban Water Supply and Sewerage Corporation (AUWSSC) is responsible for developing, operating, and maintaining the urban piped water system. The water system appeared in the 1980s to supply a few hundred thousand people with water and sanitary facilities (Birtley 2018). The centralized sewerage system served the Macrorayon area (Hassib and Etemadi 2016). The facilities are currently managed by the Macrorayon Repairing and Maintenance Corporation of Kabul Municipality. It implements two wastewater treatment plants: north and south. However, the system has an unstable electricity supply, and the facilities are more than 30 years (JICA 2009). The treatment efficiency is not known as the Macrorayon Repairing and Maintenance Corporation laboratory is out of order and cannot analyze the quality of raw or treated wastewater (JICA 2011). Therefore, even the Macrorayon system is still prone to several technological and organizational deficiencies. The project Improvement of Urban Water and Sewage Services (2018–2022), run by the German Society of International Cooperation, was planned

to improve the operation of AUWSSC and support it by establishing a new sewage department (GIZ 2020). However, so far, no entity has implemented any sustainable activities to improve the sewage system in Kabul. Kabul Municipality is the primary coordinating agency for delivery of basic municipal services within the city. However, the existing legal framework has not clearly delineated authorities between national government representatives, AUWSSC, the Ministry of Urban Development and Housing, and Kabul Municipality. Both AUWSSC and Kabul Municipality continue to be responsible for managing the sewage system (Integrity Watch Afghanistan 2016).

These examples illustrate the weakness of the current unsustainable attempts to improve the situation in informal settlements without careful study of the local situation and people's behavior. The government or donors proposed solutions that are expensive and unaffordable for local people and authorities to implement and maintain (interviews with residents of Kabul, November 2020). Social housing construction and maintenance is expensive and not accessible for low-income residents living in informal settings who remain disconnected from the rest of the city. The government and donors continue to be reactive and only deal with issues when they escalate and bring about immediate consequences (interviews with residents of Kabul, November 2020). Most government and donor interventions are limited to the simple supply of basic infrastructure, whereas little is being done to promote social and behavioral change (interviews with civil servants, December 2020). The government and donors still do not know enough about the real situation in informal settlements of Kabul (interviews with civil servants, December 2020). Little has been done to adequately document and understand the living conditions of people in such informal settlements or to study dwellers' behavior.

8.4.2 COVID-19 Impact on Residents of Kabul

In December 2020, the Ministry of Public Health of Afghanistan (2020) reported that COVID-19 had infected about 0.5% of Afghanistan's population (over 55,000 people) since the start of the pandemic. However, due to the absence of an adequate reporting system and low testing capacity, it is hard to identify the exact number of COVID-19 cases in Afghanistan. The social stigma against those with the disease might also affect the current pandemic statistics as many people prefer self-medication in fear of people finding out about their illness (IOM 2021). For example, the Minister of Public Health of Afghanistan reported in August 2020 that nearly a third of Afghanistan's population—about 10 million people—had been possibly infected by COVID-19 since the start of the pandemic (Cousins 2020).

According to the official data by the end of 2020, Kabul city was the most affected part of the country in terms of confirmed cases (around 17,150), followed by Herat (8,450), Balkh (3,315), Kandahar (2,370), and Nangarhar (2,140) provinces (Ministry of Public Health of Afghanistan 2020). In the last quarter of 2020, the highest rise of confirmed cases was in Kandahar (58%), Balkh (58%), and Nangarhar (53%) provinces. Nevertheless, Kabul remains the leader in terms of the total incidence of cases. Government officials have released varying numbers of COVID-19 cases in Afghanistan. For example, Mohammad Yaqub Haidari, the provincial governor for Kabul, stated that roughly 2 million residents had been infected, making up nearly one-third of the city population (Sorush 2020).

At the early stage of the COVID-19 spread, globally suggested actions against the virus centered on limiting the transmission, including social distancing, quarantine, and closure of public places. The Afghanistan government's measures to contain the spread of COVID-19 also involved border closures, lockdowns, and efforts to promote handwashing and social distancing to avoid "the high transmission scenario" (UNDP 2020). In the case of Kabul's informal settlements, the implementation of globally recommended policy actions without adequate adaptation to the local conditions became impractical and hard for the urban poor to follow. The overview of the situation in informal settlements of Kabul allows us to conclude that:

- The lockdowns and the closure of markets and social spaces left the urban poor without the opportunity to earn and afford living even in an informal setting;
- The implementation of handwashing was impractical for informal settlements that lack adequate access to clean water and struggle with poor sanitation;
- Social distancing or self-isolation is a luxury that the urban poor living in densely populated informal settlements cannot afford because they have to share the basic infrastructure available to them to survive;
- Informal settlements with poor sanitary conditions can become the main hot spots for transmitting the virus to the other parts of the city.

We elaborate on each of these observations in the remainder of this section.

The lockdowns and the closure of markets and social spaces left the urban poor without the opportunity to earn and afford living even in an informal setting. The restricted movement and closure of street markets left many urban poor people who had been working as street vendors and unskilled cheap labor unable to earn a living to

support their families (interviews with Kabul residents, November 2020). The closure of markets and the absence of street markets also left the urban poor without the opportunity to access affordable food products (interviews with local civil servants, December 2020). Different from other groups of the population with devices enabling them to continue working from home, street market workers tried to continue their services by knocking at doors and putting their potential customers at risk of infection. "The danger of hunger is greater for these people than the danger of being infected by COVID-19. Therefore, they prioritize to continue working in a hidden way to survive" (interview with a Kabul entrepreneur, December 2020). Even living in informal housing became unaffordable for some urban poor people, not having enough savings to cover daily expenses required to rent or maintain a shelter.

Informal settlements in Kabul provide essential low-cost housing to many residents. Poor and middle-income residents of Kabul do not have other choices than living in informal settlements due to the lack of affordable formal housing (interviews with residents of Kabul, November 2020). The cost of building an individual house following all formal standards is an expensive luxury that average households cannot afford due to low income levels (Bedford 2007). In 2018, average annual household income in the Central/Kabul region was estimated at $2,400 (Akseer et al. 2018), whereas the price of formal housing was from $30,000 to $500,000 depending on the size and the city area (Collier, Manwaring, and Blake 2018). This discrepancy means that in the case of Kabul, the cost of housing exceeds the average annual household income by more than 12 times. According to the OECD estimates, an "affordable" housing price should not exceed 3.5 times the mortgage applicant's annual income (del Pero et al. 2016).

The implementation of handwashing was impractical for informal settlements that lack adequate access to clean water and struggle with poor sanitation. Living in the informal settlements of Kabul is associated with many health risks due to the low quality of drinking water and absence of adequate sanitation. The groundwater is used by households for drinking without adequate cleaning from sources of contamination such as human wastewater that pass to the groundwater uncleaned due to the lack of an adequate sewage system. Among surveyed households in Kabul in 2012, around 30% of people have a flush toilet connected to septic tanks, while over half (55%) have a traditional pit latrine (ILO 2012). The septic tanks are made of stone or brick, allowing the wastewater to disperse from the tank to the ground (Amiri 2018). In some cases, the Kabul Municipality through contractors collects the human waste from the septic tanks (Hassib

and Etemadi 2016). However, the collected waste goes on agricultural lands and sometimes into the Kabul River or vacant lands. Households themselves empty their septic tanks by dispensing the collected waste onto farmland as fertilizer (JICA 2009).

Most of the informal settlements' inhabitants moved from rural areas to the city and continue their rural practices, ignoring new urban realities (Danish Refugee Council 2012). There are many cases when wastewater from toilets, kitchens, and bathrooms is discharged to the street ditches and city drains without being cleaned, threatening the quality of groundwater in the city (Hassib and Etemadi 2016). Around 6,000 sewers and drains flow into the Kabul River, contaminating its waters (Karimi 2020). The Kabul aquifers' analysis showed that groundwater was contaminated by nitrates, borates, and fecal microbes (indicated by coliform bacteria) (Zaryab et al. 2017). The current practice of wastewater disposal poses several biohazard risks and fosters the spread of COVID-19 in informal settlements.

Social distancing or self-isolation is a luxury that the urban poor living in densely populated informal settlements cannot afford because they have to share access to the basic infrastructure available to them to survive. The densely populated informal settlements are more sensitive to the fast transmission of infections. The dense housing conditions with shared rooms and toilets provide limited options for social distancing and self-isolation (interviews with residents of Kabul, November 2020). The urban poor are living in extremely crowded conditions with two or more families living together and sharing rooms (interviews with Kabul residents, November 2020). During the lockdown, the urban poor had to spend a longer time together. Infection transmission usually occurs within households sharing rooms, sleeping places, and toilets (interview with a nurse working in a public hospital, November 2020). Grandparents taking care of grandchildren may be easily infected by kids playing on the street and interacting with other children.

For people living in Kabul's informal settlements, it is common to have water and toilets shared by several households (interview with a doctor, December 2020). The shared water points pose risks for social distancing and social isolation. The use of shared toilets increases the risks of COVID-19 transmission and makes it difficult to follow suggested hygiene procedures or apply physical distancing (Wasdani and Prasad 2020). Due to poor sanitary conditions, most of the informal settlements' dwellers have preexisting chronic illnesses like diabetes, asthma, and cardiovascular disease (interview with a nurse working in a public hospital, November 2020). Hence, they are already at the highest risk of death and further complications.

Informal settlements with poor sanitary conditions can become the main hot spots for transmitting the virus to the other parts of the city. There was insufficient public awareness of COVID-19 and its negative impact on public health (interview with a nurse working in a public hospital, November 2020). The government did not introduce any public campaign to inform dwellers of informal settlements, who lack access to TV, radio, and other information sources, about the COVID-19 suppression measures (interviews with residents of Kabul, November 2020). Simultaneously, the government requested all residents to follow the established rules of handwashing and social distancing, punishing all people who did not follow these new rules (interviews with civil servants, December 2020). In many cases, residents of informal settlements infected by COVID-19 continued interacting with people living in other parts of the city simply because they had to continue their informal businesses to survive, increasing the COVID-19 transmission risk (interviews with civil servants, December 2020).

In many cases, residents of informal settlements are not educated and have poor health literacy, and they do not become aware of what type of illnesses or diseases are spreading in their neighborhood (interview with a doctor, December 2020). Often, dwellers of informal settlements live with chronic health conditions, mainly treating only their visible symptoms (interview with a doctor, December 2020). In the case of a fever or cough, poor people usually visit informal health providers such as traditional and herbal practitioners who do not keep records of their patients and cannot correctly diagnose and treat a new type of virus or infection (interview with a nurse working in a public hospital, November 2020). Cost and distance remain among the key obstacles to accessing public health care institutions.

8.5 Key Findings and Policy Recommendations

The COVID-19 pandemic became a trigger to reassess the role of the informal settlement in sustainable urban development. In many cases, the Afghanistan government, like most Central Asian governments, refuses to accept informal settlements and does not pay enough attention to informal urban dwellers' presence. The Kabul study showed how the COVID-19 pandemic accelerated the existing urban inequalities and how the Afghanistan government's insufficient attention to scattered settlements undermined reaching sustainable urban development. Informal settlements represent urban spaces with significant public health risk, requiring special attention from the Central Asian governments regarding urban hygiene. The situation with informal settlements cannot continue to be overlooked if the Central

Asian governments want to protect their citizens from the transmission of COVID-19 or other viruses and infections and want to strengthen the public health system.

The Afghanistan government should recognize that people cannot be invisible or blamed just because they live in urban settings that are not officially recognized. In many cases, urban poor people became victims of circumstances by entering customary contracts, and they need special assistance and government protection. By ignoring informal settlement dwellers, the national and local authorities of Afghanistan are losing control over cities' health conditions. Due to the absence of critical demographic data, it is hard to understand the real impact of viruses like COVID-19 and to plan and implement adequate measures to stop the spread of viruses and infections in cities. To achieve urban sustainability, transformation of informal settlements should start from documenting people and their living conditions.

To change the current situation, policy actions must be evidence-based and rely on sound research aiming to fill the data gap about people living in informal settlements. The Afghanistan government should pay special attention to assessing health conditions in informal settlements. There is a need for research to find creative ways of developing affordable housing in Kabul. Centralized network-based solutions for connecting informal settlements with basic services such as water and sanitation can be costly and incredibly challenging to implement. Planning interventions should not be expensive and should be applicable to the local situation. There should be a place for innovation and inventory of alternative decentralized local solutions to improve water management in informal settlements by providing small-scale safe water systems (Ali 2010). Examples include an innovative design of water kiosks based on meter clusters across the cities in Kenya (Chakava 2013) and the prepaid water meter standpost systems in urban areas of Ghana (WSUP 2017). These water delivery options remove the need to install expensive meter reading and billing systems, require much lower capital investment than traditional centralized water systems, significantly reduce consumer tariffs, and show high net benefits for utilities (WSUP 2017). At the same time, these forms of water supply require trust and cooperation and sometimes a prior agreement between households (WSUP 2018).

The Afghanistan government should stop repeating the same mistakes they have made by attempting to improve the situation in informal settlements from the top. Local dwellers will continue to resist accepting new infrastructure and rules imposed from the top if they are unaffordable and unfeasible for them to have, follow, and maintain. It is useless to impose high regulatory standards that are not implementable or affordable in informal settings. It is not enough to run upgrading

programs that are often limited to physical improvements. There is a need for an integrated approach to all development dimensions of informal settlement living. General public education is also one of the key development priorities in informal settlements. Socioeconomic barriers such as poverty, discrimination, child labor, and tenure insecurity complicate timely enrollment in school (Children in Crisis 2017; Hirsch-Holland 2019). This issue requires a multilevel intervention to meet the education and physical needs of children and their families in informal settlements. Close cooperation with communities may improve access to education for girls and provide advice and support to internally displaced and returnee children, who often face discrimination.

The success and sustainability of any development interventions in informal settlements depend on the level of local community buy-in and participation. The assessment of the Kabul city case revealed that the achievement of SDG 3 (Good health and well-being), SDG 6 (Clean water and sanitation), and SDG 11 (Sustainable cities and communities) requires the Afghanistan government to encourage collaborative and participatory planning, thereby also adding the value of achieving SDG 17 (Partnerships for the goals). The national government should invest in the Kabul city government's capacity to engage in local partnerships and incentives to cooperate with local stakeholders. When internal resources are weak and dependence on external resources is not sustainable, there is a need to help informal settlement dwellers find ways to achieve self-reliance and resilience. There is a need to search for community rooted local development leaders who are familiar with the local situation and trusted by residents. These local representatives can be educated and equipped to foster the effective formulation and implementation of local strategies.

Local strategies should focus on dwellers by not giving or delegating but sharing responsibilities and working together. Instead of blaming and stigmatizing residents of informal settlements, there is a need to collaborate with them and allow them to engage in finding more effective and sustainable local development strategies. Local government and local leaders of Kabul can work together to develop scalable, cheap provision of good quality drinking water and safe sanitation. There are positive examples of delegating operation and maintenance to local entrepreneurs for water supply systems in informal settlements in Benin, Rwanda, and Haiti (World Bank 2015). Governments provide training to local operators while monitoring the sustainability and quality of service provision. Another successful initiative includes the bio-centers in informal settlements in Nairobi (and later in other Kenyan cities) that a nongovernment organization introduced in collaboration with community-based groups, organizations, and coalitions

(Rufin and Friedl 2018). The bio-centers offer sanitary services for a small fee, also generating revenue by renting out public spaces for events to local communities or other parties, water vending, and a cybercafé.

It is important to bring about not only infrastructural but also behavioral changes. Interventions to promote behavior change are more effective when they are implemented at the community level. Local government of Kabul should work closely with local leaders to inform informal settlement dwellers about the health consequences of their current way of living and how their health is impacted by harmful behavior such as unrestricted use of groundwater and spilling wastewater on streets. The local strategies should bring together social, economic, and ecological dimensions of development. Development plans should match well with local institutional capacities.

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Appendix 8.1: Interview Questions

(1) Who have been the most vulnerable residents during the COVID-19 pandemic in Kabul? Have they received any aid from the government or other actors before or during COVID-19?

(2) What specific health challenges did the residents of informal settlements in Kabul face before and during the pandemic? What are the primary causes of illnesses? Whom do they address to get treatment?

(3) Do you have relatives or friends living in informal settlements of Kabul? How are they coping with COVID-19?

(4) Are there any specific health issues for the city residents caused by water and sewerage services?

(5) Do you have relatives or friends living in Kabul who do not have access to water and sewerage?

(6) What are the lessons learned for Kabul's development during the pandemic, particularly concerning informal settlements and access to water and sanitation? What kind of changes do you want to see in the government's assistance to improve the living situation in informal settlements?

9

Household Energy Consumption Behaviors During the COVID-19 Pandemic in Mongolia

Dina Azhgaliyeva, Ranjeeta Mishra,
and Kamalbek Karymshakov

9.1 Introduction

This study investigates the determinants of household demand for space heating in Mongolia and compares differences before and during the coronavirus disease (COVID-19) pandemic. In developing cold-climate countries like Mongolia, heating is a basic survival good.

COVID-19 significantly affected household income, employment, and expenditure (Morgan and Trinh 2021). Surveying eight Southeast Asian households, Morgan and Trinh (2021) demonstrated significant declines in income and employment during the COVID-19 crisis compared to the preceding period. Nearly half of all households experienced financial difficulties due to COVID-19; of these, nearly all had to reduce consumption, about half drew down cash and savings, and roughly one-third borrowed from friends or relatives, delayed payments and debt repayment, or applied for government aid.

Traditionally a largely agricultural country with a significant share of the population living in rural areas, Mongolia is experiencing a growing industrial sector, which is increasing urbanization, as are domestic structural transformation and the impacts of climate change in the form of natural disasters and livestock losses. This plus the growing overall population increase has resulted in higher energy demand. In addition to being one of the coldest countries globally, Mongolia has the highest recorded levels of urban air pollution. The country requires access to reliable and clean heating services for survival.

Mongolia has exceptionally harsh climate conditions, with average outdoor temperatures of –6 °C between September and April and –20 °C between November and January (NOAA 2019). As a result of the 8-month heating season, the housing sector is the country's biggest energy consumer and makes up 42% of the total heating demand, followed by industry and construction with 24% each. In 2015, the buildings sector was responsible for around 43% of greenhouse gas emissions from energy demand (Ministry of Environment and Tourism 2018). In 2017, Mongolia had the fifth-worst air pollution in Asia, with particulate matter of less than 2.5 µm in diameter having an annual mean of 75 µg per cubic meter of air (van Mead 2017), to which coal-based heating is a significant contributor.

According to the Multiple Indicator Cluster Survey (MICS) Plus report (UNICEF 2021), a much smaller proportion of households use clean fuels for heating (34%) than for cooking (51%) or lighting (100%). Thus, studying the determinants of fuel choice for heating in Mongolia is important.

The existing literature on the determinants of fuel choice for heating and cooking has identified households' socioeconomic and demographic characteristics, dwelling characteristics, and climatic conditions (Jaime, Chávez, and Gómez 2020). Households' socioeconomic and demographic characteristics include income and size; age, education, and gender of the household head; and location (rural or urban) (Lewis and Pattanayak 2012; Muller and Yan 2018; Timilsina 2014).

Research studies on households' fuel choice in Mongolia include Ganchimeg and Havrland (2011), Ganchimeg (2013), Tsevegjav (2013), and Wang et al. (2021). This literature shows that air pollution has become a policy priority. Among the approximately 170,100 herder households in Mongolia, only 77.2% are reported to have electricity, forcing them to rely on the burning of livestock dung as a fuel for heating and cooking.

Studies on household fuel choices in other Central Asia Regional Economic Cooperation Program member countries include Azhgaliyeva et al. (2021), Kapsalyamova et al. (2021), Sabyrbekov and Ukueva (2019), and Gassmann and Tsukada (2014). These reports have also highlighted the importance of socioeconomic and demographic characteristics, dwelling characteristics, and climate conditions on household fuel choice in Kazakhstan and the Kyrgyz Republic.
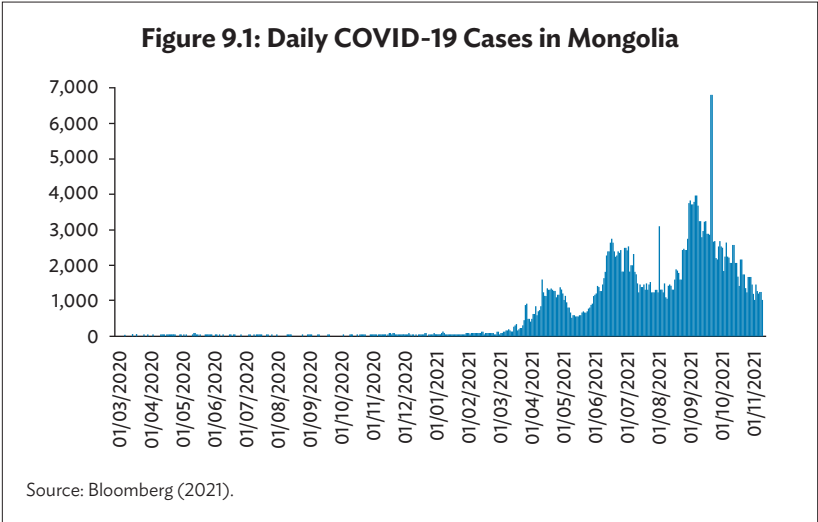
Lockdowns due to COVID-19 have made people spend more time at home, thus changing the fuel needs for cooking and heating. Additionally, use of more fossil fuels for household cooking and heating has increased the threat of hazardous indoor pollution.
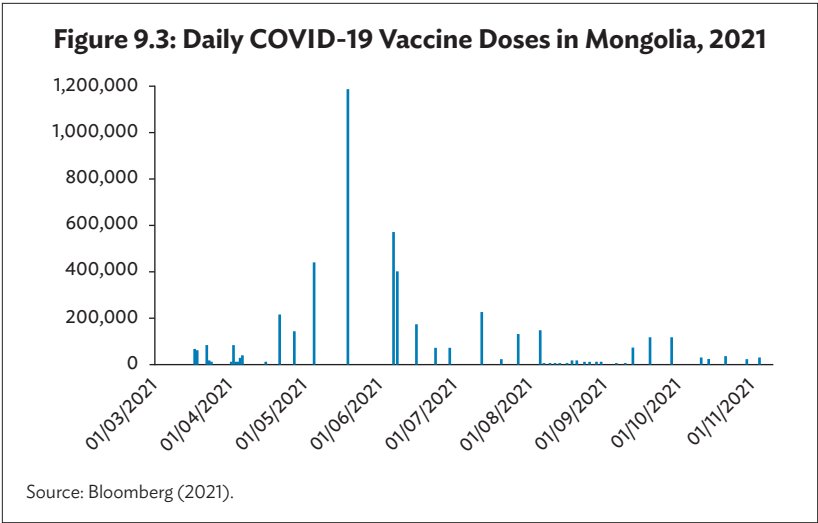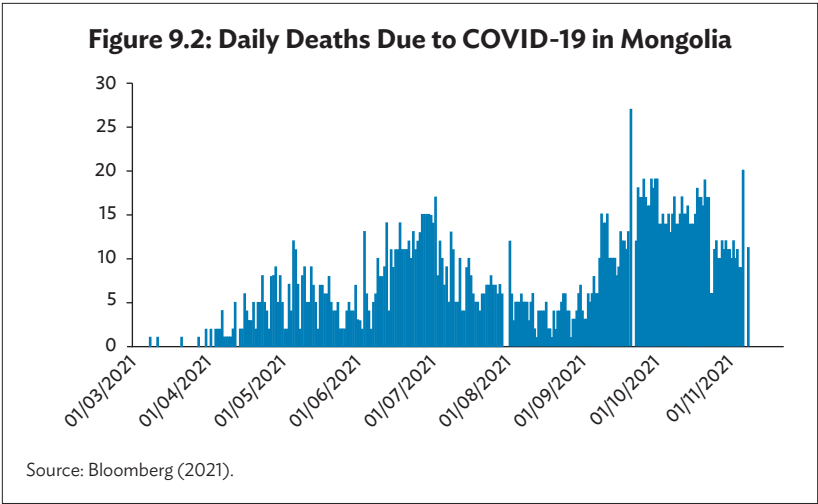
For all of these reasons, we have investigated the impact of COVID-19 on household fuel choice in Mongolia using the publicly available MICS Plus longitudinal household survey from the United Nations Children's Fund (UNICEF), which drew data from 2,000 households through telephone interviews. The main contribution of this chapter is that it assesses the determinants of fuel choice in Mongolia during the COVID-19 crisis in 2021. To the best of our knowledge, this is the first study to have addressed this issue.

9.2 Spread of COVID-19 and Government Responses in Mongolia

According to Bloomberg (2021) data, COVID-19 cases and deaths in Mongolia started to significantly increase beginning in March–April 2021 (Figures 9.1–9.2). Figure 9.1 demonstrates three peaks of COVID-19 infections in April 2021, June–July 2021, and September–October 2021.

COVID-19 vaccination in Mongolia started in March 2021, with most vaccines provided in May–June 2021. The peak of vaccination was in May 2021, with around 1.5 million vaccine doses, which is a significant number given the total population of 3.2 million (World Bank 2021). As of November 2021, Mongolia has administered at least 4.8 million doses of COVID vaccines. Assuming that every person needs two doses, that is enough to have vaccinated about three-quarters of the country.

Figure 9.1: Daily COVID-19 Cases in Mongolia

Source: Bloomberg (2021).

Figure 9.2: Daily Deaths Due to COVID-19 in Mongolia

Source: Bloomberg (2021).

Figure 9.3: Daily COVID-19 Vaccine Doses in Mongolia, 2021

Source: Bloomberg (2021).

As indicated in Figure 9.3, COVID-19 vaccination started in Mongolia in March 2021. To finance vaccination and other responses to the COVID-19 outbreak, Mongolia, like many other developing countries, received loans from multilateral institutions (Figure 9.4). Mongolia started to receive pandemic loans beginning in April 2020, with the largest loans in Q2 2020 and Q2 2021. Pandemic loans were provided mainly to the Government of Mongolia.

Figure 9.4: COVID-19 Pandemic Loans to Mongolia

Source: Bloomberg (2021).
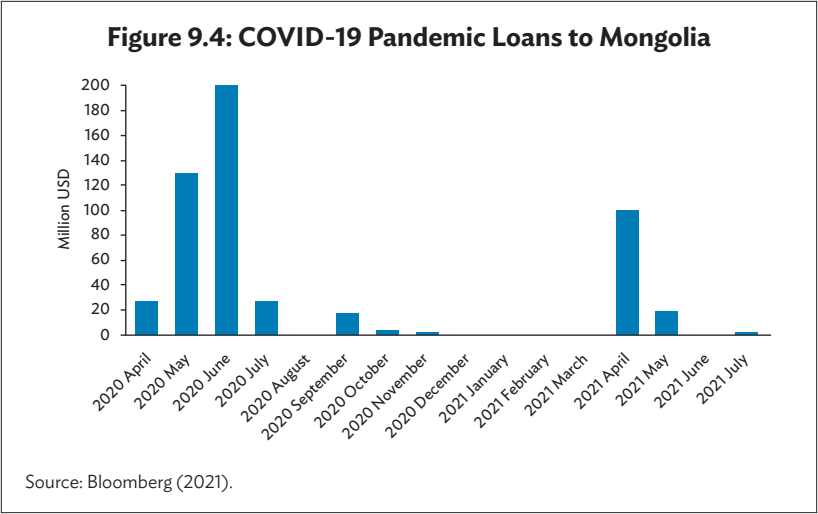
Mongolian governmental responses to COVID-19 began as early as the end of January 2020, while economic support started at the end of March 2020 (Figure 9.5) according to the COVID-19 governmental response indexes developed by the University of Oxford, Blavatik School of Government (Hale et al. 2020). Indexes measure how many of the relevant indicators a government has acted upon, and to what degree, on a scale from 0 to 100 (Table 9.1).

Figure 9.5: Mongolian Governmental Response to COVID-19

Source: Hale et al. (2020).
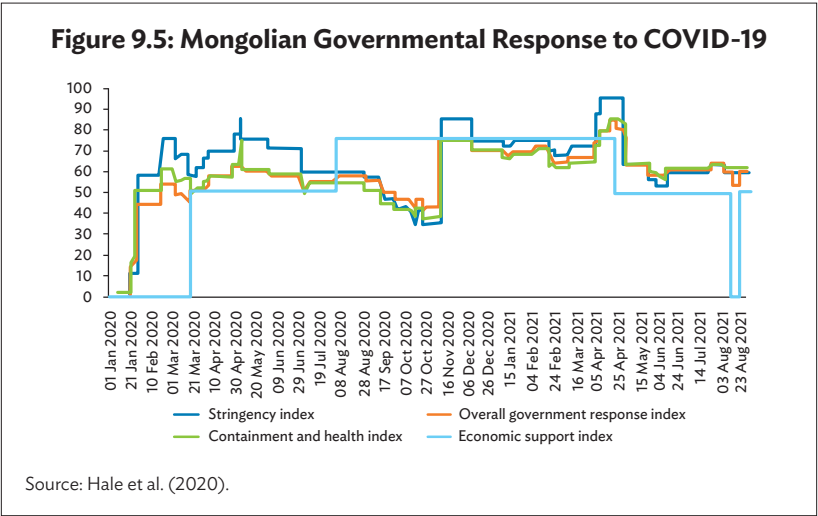
Table 9.1: COVID-19 Governmental Response Indexes

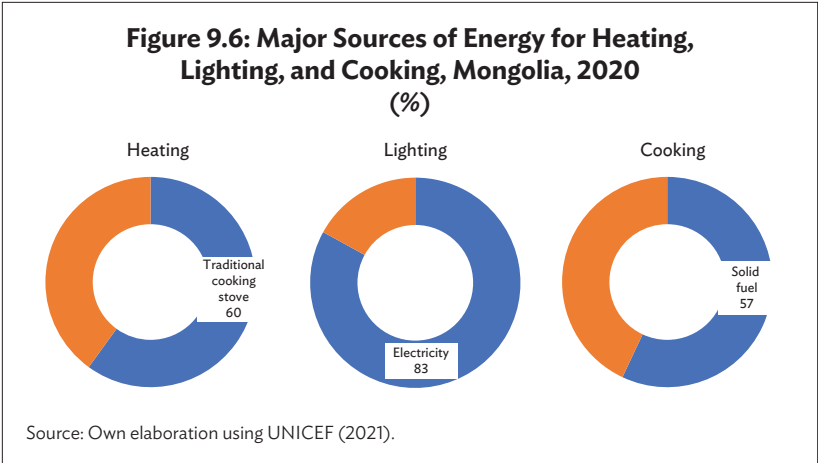| Index	Description
Overall governmental response index	Measures response of governments over all indicators.
Containment and health index	Measures "lockdown" restrictions and closures with measures such as testing policy and contact tracing, short-term investment in health care, and investments in vaccines.
Stringency index	Measures the strictness of "lockdown" policies that primarily restrict people's behavior.
Economic support index	Measures such as income support and debt relief.

Source: Hale et al. (2020).

9.3 Data and Methodology

9.3.1 Data

Mongolia is the first country to release MICS Plus results, with its first two waves of computer-assisted telephone interviewing (CATI) calls completed in early 2021. The first wave centered on distance learning for children aged 2–17 years, while the second wave focused on food security and children's nutritional status. CATI is reliable for Mongolia due to a high coverage of phone numbers: 95% of households have phone numbers (97% in urban and 91% in rural areas) (UNICEF 2021).

The MICS Plus questionnaire contains not only household and dwelling characteristics but also 12 questions on household energy use. The questions cover the types of fuel for cooking, heating, and lights, as well as improved, processed fuel sources and measures for heating safety. Solid fuel combustion is also the largest contributor to outdoor particulate matter in Ulaanbaatar (ADB 2014). Air pollution is the cause of 11% of premature deaths in the city and represents a social cost of about $177–$727 million a year (World Bank 2011). Ulaanbaatar used to be the city with the second-worst air pollution in the world (WHO 2012). As a result, in mid-2020, use of raw coal for heating by Ulaanbaatar households without access to district heating was banned. Since then, households in the city have been supplied with processed fuel instead
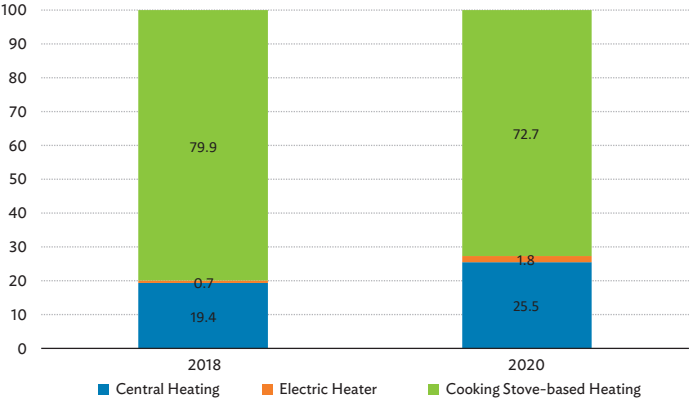
of raw coal (Xinhua 2020). Coal is abundant and is the only fossil fuel available in the country (ADB 2014).

For our data analysis, we used Wave 2 (December 2020) of the UNICEF MICS Plus survey in Mongolia, which was conducted during the COVID-19 crisis in December 2020. We also used MICS survey data from 2018 for comparison. The data show that in 2020 60% of households used a traditional cooking stove for space heating, 83% of households used electricity for lighting requirements, and 57% of households used solid fuel for cooking (Figure 9.6). Figure 9.7 presents the households reporting cooking stoves as their source of space heating. Space heating in 2018 was usually provided using a traditional cooking stove (80%), central heating (district heating system) (19%), and electric heating (1%) (Figure 9.7). The share of households using central heating increased in 2020 to 26% from 19% in 2018. The percentage of households reporting consumption of improved fuel for their heating requirements increased in 2020 compared to 2018 (Figure 9.8).

Figure 9.6: Major Sources of Energy for Heating, Lighting, and Cooking, Mongolia, 2020 (%)

Heating — Traditional cooking stove 60

Lighting — Electricity 83

Cooking — Solid fuel 57

Source: Own elaboration using UNICEF (2021).

Figure 9.7: Proportions of Heating Types, Mongolia, Before and During COVID-19 (%)

Source: Own elaboration using UNICEF (2021).

Figure 9.8: Heating Energy Types and Security of Supply, Mongolia, During COVID-19
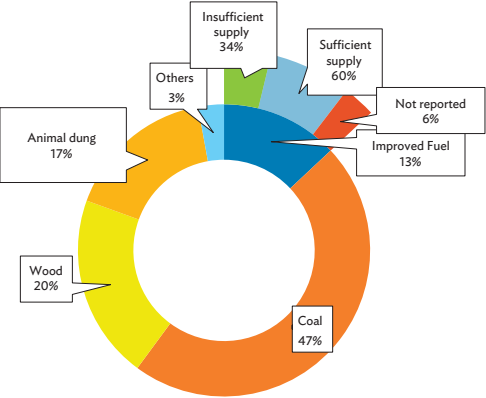
Source: Own elaboration using UNICEF (2021).

Figure 9.9 demonstrates the share of households reporting the use of clean fuel and technologies for heating (district heating, renewable energy, and electricity). The difference between 2018 and 2020 (before and during the COVID-19 era) is not large. Clean heating was mainly used by richer households, those in Ulaanbaatar, and urban households.

Figure 9.9: Clean Heating Across Wealth Groups, Region, and Rural/Urban Population Area, Mongolia, 2018 and 2020

Source: Own elaboration using UNICEF (2021).
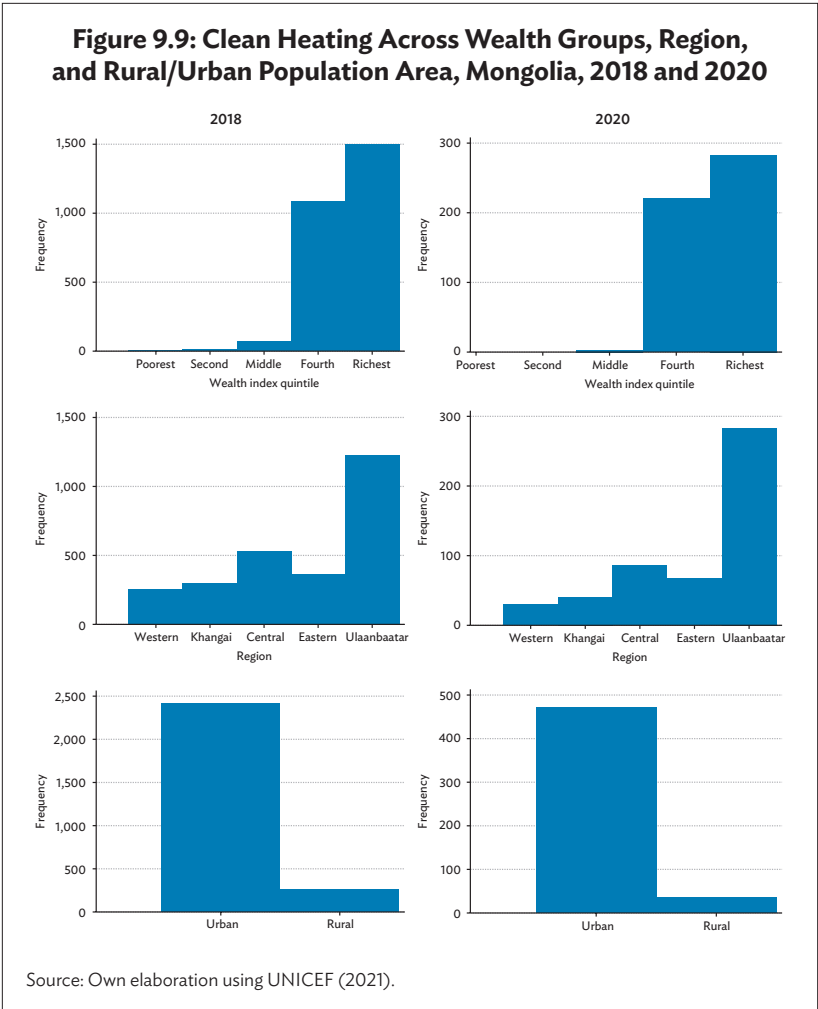
Summary statistics and sample distributions across wealth group, regions, and urban/rural populations are provided in Table 9.2 and Figure 9.9. The number of observations in 2020 was 1,987 and 14,500 in 2018.

Table 9.2: Summary Statistics for Heating Type and Household Characteristics, Mongolia, 2018 and 2020

| Variables	2020				2018			
	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.
Heating type								
• District (central) heating	0.25	0.43	0	1	0.19	0.39	0	1
• Space heater	0.02	0.13	0	1	0.01	0.08	0	1
• Cook stove	0.73	0.45	0	1	0.75	0.43	0	1
Household head gender: female	0.18	0.38	0	1	0.21	0.40	0	1
Household size	4.00	1.73	1	12	3.61	1.66	1	15
Household head age	46.90	13.52	17	95	46.48	14.13	15	95
Dwelling type								
• Apartment, condominium	0.23	0.42	0	1				
• Convenient single-family house	0.02	0.15	0	1				
• Single-family house	0.35	0.48	0	1				
• Ger (yurt)	0.38	0.49	0	1				
• Public accommodation, Dormitory	0.02	0.12	0	1				
• Other	0.00	0.04	0	1				
Access to electricity	0.76	0.42	0	1	0.77	0.41	0	1
Cooking fuel								
• Solid fuel	0.57	0.49	0	1	0.64	0.48	0	1
• Electricity	0.38	0.49	0	1	0.35	0.48	0	1
• Liquid petroleum gas (LPG)	0.01	0.12	0	1	0.01	0.10	0	1
Wealth Index								
• Poorest	0.25	0.44	0	1	0.05	0.21	0	1
• Second	0.19	0.39	0	1	0.29	0.45	0	1
• Middle	0.17	0.37	0	1	0.23	0.42	0	1
• Fourth	0.18	0.38	0	1	0.23	0.42	0	1
• Richest	0.13	0.34	0	1	0.15	0.35	0	1
Region								
• Western	0.18	0.38	0	1	0.25	0.44	0	1
• Khangai	0.18	0.38	0	1	0.21	0.40	0	1
• Central	0.18	0.38	0	1	0.16	0.37	0	1
• Eastern	0.18	0.38	0	1	0.13	0.34	0	1
• Ulaanbaatar (capital city)	0.28	0.45	0	1	0.23	0.42	0	1
Area								
• Rural	0.44	0.50	0	1	0.50	0.49	0	1
• Urban	0.56	0.49	0	1	0.49	0.49	0	1

N=1,987 in 2020; N=14,500 in 2018.
Source: Own elaboration using UNICEF (2021).

The sample is distributed across different wealth groups, regions, and rural/urban populations. Most households are from the poorest wealth group (Figure 9.10).

Figure 9.10: Sample Distribution across Wealth Groups, Regions, and Urban/Rural

Source: Own elaboration using UNICEF (2021).
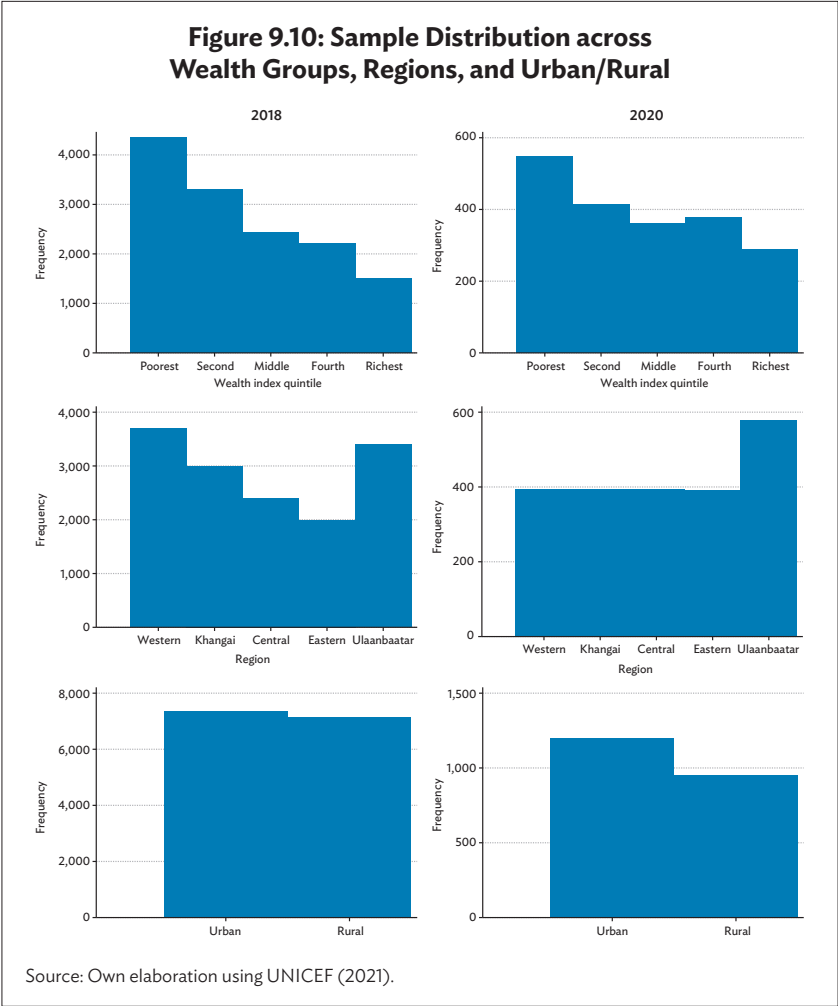
9.3.2 Methodology

Using the multinomial logit model, we modeled the factors affecting the choice of space heating system in Mongolia. We modeled the probability of adoption of a particular heating system, i.e., central heating, space heaters, and cooking stoves, for heating using the following equation:

$$\text{iHeating\_system} = \alpha_0 + \alpha_1 \text{ Gender\_HH} + \alpha_2 \text{ Gender\_HH}$$
$$+ \alpha_3 \text{ Household\_size} + \alpha_4 \text{ Electricity\_Access} + \alpha_5 \text{ Cooking\_type}$$
$$+ \alpha_6 \text{ Wealth\_index} + \alpha_7 \text{ Dwelling\_type} + \alpha_8 \text{ Location}$$
$$+ \alpha_9 \text{ Region} + \epsilon_i, \tag{1}$$

where iHeating_system is a categorical variable that takes value of 1–3 based on the heating system installed in the household (cooking stove for space heating as base category). Independent variables include household characteristics such as household head's age and gender, household size, and household location (i.e., rural vs. urban areas); wealth classes (five classes being pre-generated in the data set, with the poorest as the base category); energy infrastructure and built environment with access to electricity (dummy); type of cooking system; and type of dwelling unit. ϵ_i represents the error term. We estimated the equations for pooled data years 2018 and 2020 with year dummy and separately for both years.

9.4 Results

Table 9.3 presents estimation results of the multinomial logit model on heating types. Empirical analyses are based on MICS Plus survey data from 2018 and 2020 and pooled data combining both survey years.

The dummy variable indicating the year 2020 to approximate the impact of COVID-19 shows that, in December 2020, after the onset of COVID-19, households were more likely to use district heating and manufactured space heaters than a cooking stove for heating, as compared to 2018. This could be due to the need to spend more time at home due to lockdowns and a preference for a more comfort and warmth.

Generally, household characteristics have expected impacts on heating types. Female-headed households had a higher likelihood to use district heating, in both survey years. This is in line with the empirical literature reporting that female-headed households are likely to use clean energy (Rahut, Behera, and Ali 2016). Household size had a negative impact on the likelihood to use district heating, and interestingly, this

effect was statistically significant only for 2018 and in the pooled data. Larger households are generally settled in houses with large spaces not connected to district heating. This finding was also supported by the results on dwelling types for 2020. Households living in single-family houses showed a higher probability to use a cooking stove for heating, with a reduced use of district heating and manufactured space heaters. Households with higher household-head ages showed a lower use of manufactured space heaters compared to cooking stoves, though this effect is valid at a lower level of statistical significance.

Use of clean cooking fuel demonstrated a strong and statistically significant correlation with the probability to use district heating and manufactured space heater compared to the cooking stove for heating. This effect is valid for both years except for district heating in the 2020 sample. This effect was expected, given the probability that households use cooking fuel also for heating. In line with this finding, a study by Kapsalyamova et al. (2021), examining Kazakhstan and the Kyrgyz Republic, stated that the same stove could be used for cooking and heating. Therefore, cooking with clean fuel is positively associated with district heating and a manufactured space heater.

Empirical results on the impact of the wealth index indicated that higher income, starting from middle income, led to an increasing probability of using district heating. However, this effect is evident only in the 2018 sample and the pooled sample. In general, this finding is in line with the mainstream literature arguing that with higher income households tend to consume cleaner fuels (Leach 1992).

Table 9.3: Results

Variables	2020		2018		2018–2020	
	District Heating	Manufactured Space Heater	District Heating	Manufactured Space Heater	District Heating	Manufactured Space Heater
Household head gender (female=1)	1.000*	0.0542	0.652***	−0.054	0.662***	−0.0748
	(0.511)	(0.690)	−0.113	−0.31	(0.107)	(0.280)
Household size	0.00440	0.110	−0.131***	−0.0312	−0.128***	−0.00499
	(0.124)	(0.133)	−0.0293	−0.0695	(0.0273)	(0.0604)
Household head age	0.0199	−0.0252	−0.00102	−0.0117	−0.000738	−0.0142*
	(0.0154)	(0.0174)	−0.00323	−0.00817	(0.00304)	(0.00727)
Dwelling type (base category: apartment, condominium)						
• Convenient single-family house	−5.711***	−1.664*				
	(0.787)	(0.987)				
• Single-family house	−5.299***	−0.941				
	(0.528)	(0.758)				
• Ger (yurt)	−5.908***	−0.634				
	(0.952)	(0.881)				

Table 9.3 *continued*

Variables	2020		2018		2018–2020	
	District Heating	Manufactured Space Heater	District Heating	Manufactured Space Heater	District Heating	Manufactured Space Heater
• Public accommodation, dormitory	–1.382	–18.28				
	(0.854)	(7,986)				
• Other	–22.97	–17.93				
	(13,752)	(11,195)				
Access to electricity	1.399	15.07	–0.93	–1.645	–0.679	–0.890
	(4.824)	(2,797)	–0.619	–1.137	(0.553)	(1.090)
Cooking with clean fuel	0.856	2.839***	2.394***	2.979***	2.328***	2.948***
	(0.668)	(1.054)	–0.185	–0.729	(0.171)	(0.597)
Wealth index (lowest as base category)						
• Second	–1.382	–1.025	1.219	0.689	1.065	0.0159
	(1,422)	(3,391)	–0.803	–1,671	(0.757)	(1,587)
• Middle	12.50	15.67	2.470***	16.62	2.297***	16.41
	(908.8)	(2,688)	–0.783	–1,327	(0.732)	(1,200)
• Fourth	16.55	16.69	5.648***	18.3	5.647***	17.87
	(908.8)	(2,688)	–0.777	–1,327	(0.725)	(1,200)
• Richest	20.09	20.05	10.09***	18.84	10.11***	19.24
	(908.8)	(2,688)	–0.825	–1,327	(0.773)	(1,200)
Regions (western as base category)						
• Khangai	0.232	–1.043	0.0838	–0.48	0.103	–0.616
	(0.871)	(0.934)	–0.171	–0.52	(0.161)	(0.450)
• Central	0.721	–0.229	0.587***	–0.664	0.592***	–0.518
	(0.667)	(0.727)	–0.149	–0.48	(0.141)	(0.388)
• Eastern	0.363	–0.129	0.914***	0.136	0.903***	0.102
	(0.730)	(0.791)	–0.168	–0.479	(0.158)	(0.403)
• Ulaanbaatar (capital city)	0.128	0.666	–0.273*	0.664*	–0.179	0.637**
	(0.634)	(0.681)	–0.143	–0.367	(0.134)	(0.320)
Rural	–1.067**	0.683	–0.779***	–0.169	–0.811***	0.0961
	(0.522)	(0.591)	–0.115	–0.368	(0.108)	(0.301)
COVID-19 (year 2020=1)					0.280**	0.893***
					(0.115)	(0.211)
Constant	–16.16	–35.12	–6.393***	–21.55	–6.612***	–21.92
	(908.8)	(3,879)	–0.643	–1,327	(0.642)	(1,200)
Observations	1,987	1,987	13,798	13,798	15,785	15,785

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Own elaboration using UNICEF (2021).

Rural households showed a probability to reduce the use of district heating in both survey years. This is related to the fact that district heating is generally available in urban areas. Also, households in the central and eastern part of the country demonstrated a higher likelihood of using district heating than in the western region of the country,

whereas households in Ulaanbaatar tended to have a higher probability of using manufactured space heaters than those in the western region. However, this effect is statistically significant only in the 2018 sample.

Thus, our empirical findings do not demonstrate that household social and economic characteristics in Mongolia had a changing effect on the heating type use. However, the COVID-19 pandemic and related containment measures reflected by lockdowns may have increased the use of district heating and manufactured space heaters compared to cooking stoves.

9.5 Concluding Remarks

Using data from the UNICEF MICS Plus household survey in Mongolia in 2018 (N=1,987) and 2020 (N=13,798), this study assessed the determinants of household fuel choice for heating prior to and during the COVID-19 pandemic. MICS Plus data were collected using CATI, which is reliable for Mongolia due to a high coverage of phone numbers (95% of households overall, 97% in urban areas, and 91% in rural areas) (UNICEF 2021).

The chapter presents several interesting results on the determinants of households' cleaner heating choice. The results show that more households switched to cleaner heating in 2020 compared to 2018. The share of households using central heating increased in 2020 to 26% from 19% in 2018, and the share of households using improved fuel for their heating requirements increased in 2020 compared to 2018. Finally, in December 2020, during the COVID-19 pandemic, compared to 2018, households were more likely to use district heating and manufactured space heaters than cooking stoves for heating. This could be due to the need to spend more time at home due to lockdowns and the preference for staying in a warmer and more comfortable home.

It is crucial to understand the main drivers of household behavior concerning energy consumption and to highlight which supply-side barriers to overcome. For instance, dwellings do not always have access to all energy sources. In line with other studies (Wu and Cui 2019), we found that because central heating is mainly concentrated in big cities, gers are found in the periphery of towns, and rural areas are not connected to central heating networks, households located in rural locations showed a reduced probability of using central heating. There are upfront costs for changing to a particular heating system and thus using a specific fuel. Therefore, anecdotally, a household that wants to switch energy sources must buy and install new equipment that might be affected by dwelling occupation status, i.e., owner or tenant. The government should focus on efficient production, transmission,

and distribution to improve the central heating system and expand its network to newly developed areas. The use of clean heating is particularly important during lockdowns such as those during the COVID-19 pandemic, in order to avoid the hazardous effects of indoor pollution due to indoor solid fuel combustion.

Our findings reveal that female-household heads are more inclined toward adopting a cleaner source of residential heating. The government should focus on women-centric interventions, where the primary beneficiaries are female household members, to promote the awareness and adoption of cleaner energy sources.

This study has a few limitations due to data sources. The MICS Plus household survey in Mongolia does not investigate the household level of education, which has been shown to have a significant impact on household fuel choice (Azhgaliyeva et al. 2021; Kapsalyamova et al. 2021). Another data limitation is that the number of observations on modern fuel and related information is small (only 191 observations, representing less than 10% of the sample).

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Appendix 9.1

Table A9.1: Conversion of MICS Plus Survey to Variables Used in this Study

MICS Plus Questionnaire	Variables in this Study
EU1. In your household, what type of cookstove is mainly used for cooking?	Cooking fuel
• Electric stove	• Electricity
• Liquefied petroleum gas (LPG)	• LPG
• Cooking gas stove	• LPG
• Manufactured solid fuel stove	• Solid fuel
• Traditional solid fuel stove	• Solid fuel
• Three stone stove/open fire	• Solid fuel
• OTHER (specify)	• Solid fuel
EU4. What does your household mainly use for space heating when needed?	Heating type
• Central heating	• District heating
• Electric space heater manufactured	• Space heater
• Electric space heater handmade	• Space heater
• Manufactured cookstove	• Cookstove
• Traditional cookstove	• Cookstove
• Three stone stove/open fire	
• Wood heater with chimney	
• Low pressure steam boiler	
• Others (specify)	
• No source of heating	
• No response	

Source: UNICEF (2021).

COVID-19 and Economic Recovery Potential in the CAREC Region

The coronavirus disease (COVID-19) pandemic and subsequent economic crisis have brought unprecedented challenges for countries in the Central Asia Regional Economic Cooperation (CAREC) region, which extends from Azerbaijan to the People's Republic of China and is an increasingly important channel for international trade and energy resources. The road to recovery may be even more daunting, yet some economic trends suggest the potential for the recovery process to positively influence socioeconomic development in CAREC countries in the coming years.

COVID-19 and Economic Recovery Potential in the CAREC Region is the first of a new annual book by the CAREC Institute, published with the Asian Development Bank Institute. It explores ways to unlock sustainable and inclusive growth opportunities in CAREC countries by analyzing innovations in digital transformation, e-taxation, financial technology promotion, and debt sustainability, and the impact on small businesses and households. The book's insights provide a springboard for crisis response efforts across CAREC countries aimed at accelerating economic recovery.

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