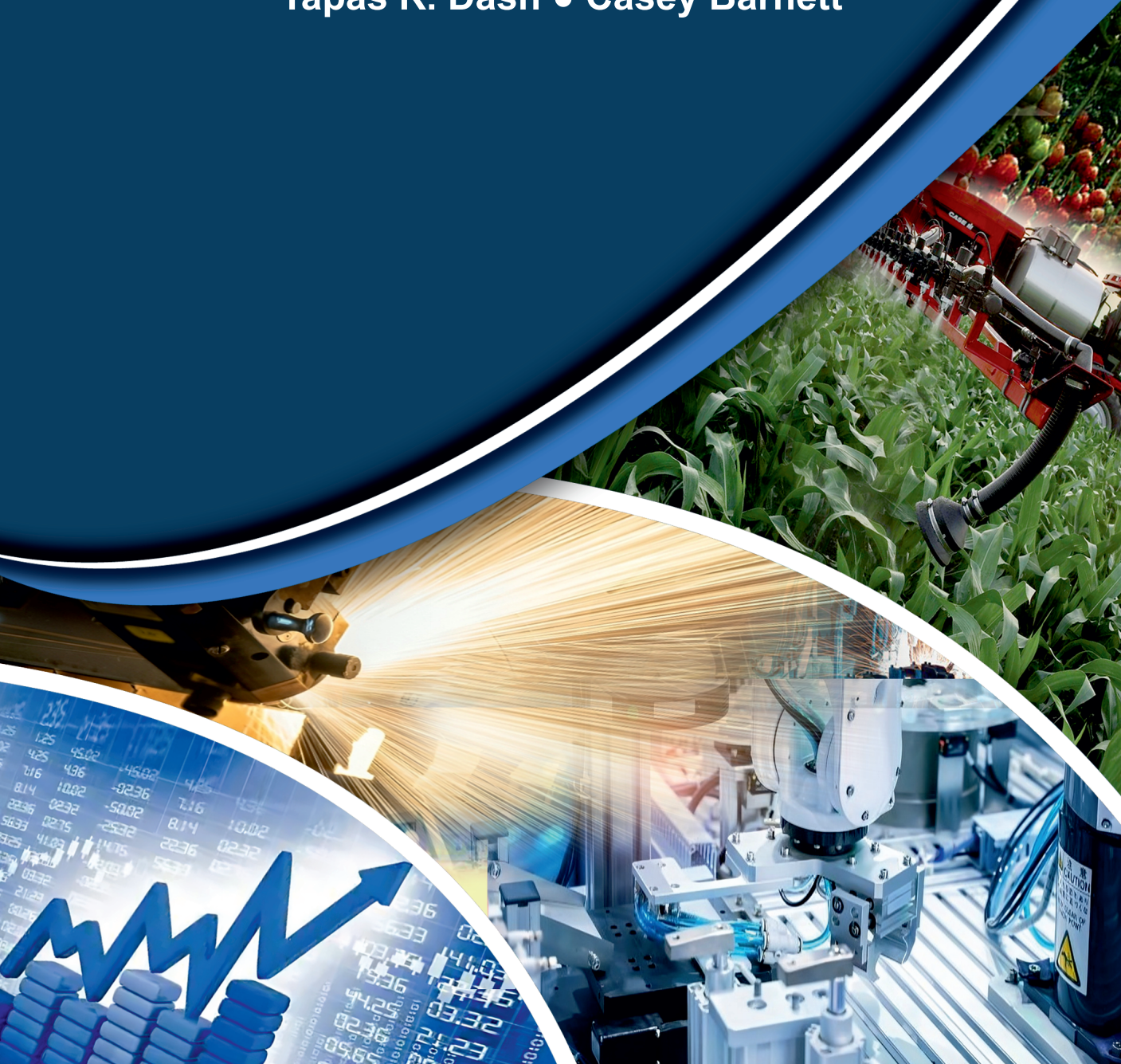
Economy, Society, and Education

Learning from the COVID-19 Crisis

Edited by

Tapas R. Dash • Casey Barnett



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E-mail: bngl.books@alliedpublishers.com

Website: www.alliedpublishers.com

ISBN: 978-93-90951-81-9

Published by Sunil Sachdev and printed by Ravi Sachdev at Allied Publishers Pvt. Ltd.,
D-5, Sector-2, Noida–201 301

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Acknowledgments

It gives us immense pleasure to bring out this research-based book, Economy, Society, and Education: Learning from the COVID-19 Crisis, in its final form. Research papers presented at the annual International Research Symposiums, organized by CamEd Business School, Phnom Penh, Cambodia, are selected for anonymous peer review based on their relevance and contribution to the field and processed for publishing in this edited volume. This book contains 13 chapters, including COVID-19: The Economy and Government Interventions and COVID-19: The Society and Education and Government Interventions.

Although the COVID-19 pandemic devasted the global economy and people's prosperity, countries' governments have taken timely measures to counteract its effect and bring nations back on the path of recovery and growth. We at CamEd Business School took a series of initiatives to create a platform for researchers and practitioners to disseminate their research findings and experiences annually to facilitate decision-making.

We thank all presenters of international research symposiums each year for their valuable contributions and for sharing opportunities for further debates and discussions. We are equally thankful to all participants, especially the students of CamEd Business School, for their meaningful participation in the symposiums.

We are grateful to the presenters from other countries, our colleagues, and the supporting staff at CamEd Business School for their invaluable contributions to making the international research symposium memorable each year.

We thank Allied Publishers Pvt. Ltd. for accepting our proposal to publish this edited book on time.

Finally, our sincere thanks to all of you for your continued support!

Tapas R. Dash • Casey Barnett

Editors

CamEd Business School

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Introduction

Tapas R. Dash

The COVID-19 pandemic paralyzed the global economy, forced millions out of jobs, and brought societies to a standstill, leading to a devastating effect on the lives of people across nations. The unprecedented economic shocks created havoc, caused many countries to experience a minimum or negative growth and reversed years of progress in poverty alleviation. The measures to control the spread of the pandemic, such as social distancing and shutdowns, impose severe setbacks on industries and push vast segments of the population into vulnerability. Workers in the informal sector, including low-wage earners, bore the brunt of the economic fallout and were the worst sufferers (Dash & Dash, 2021). Overall, across the countries, the adverse effects of the pandemic were widely felt. The crisis uncovered flaws in the existing economic systems and demanded their examination.

Cambodia's economy is heavily reliant on tourism and the garment industry. As a vital engine of Cambodia's economic growth, prior to the COVID-19 pandemic, in 2019, the tourism sector generated approximately US$5.0 billion in revenue, which equals 12 percent of the country's GDP (International Trade Administration, Department of Commerce, USA, February 21, 2024), and directly employed 630,000 workers (ADB, 2022). In 2024, it attracted 6.7 million international tourists (Ministry of Tourism, 2024), contributed US$3.6 billion in revenue, and provided approximately 510,000 direct employment (AKP, February 25, 2025). Also, the textile and apparel industry generates over one-third of Cambodia's GDP. As of 2023, the garment, footwear, and travel products sector accounted for 62.3 percent of all exports and contributed significantly to the economy's GDP by employing 918,718 workers (CDC, n.d.). Therefore, any external and/or internal shocks restricting the growth of tourism and the garment industry would significantly affect the economy of Cambodia. During the COVID-19 pandemic, due to international travel restrictions, including government-imposed quarantines and curfews, the growth of two vital engines of Cambodia substantially declined.

In response to the downturn of the economies, countries' governments have taken multifaceted measures to counteract the adverse effects of the pandemic and bring nations back on the path of recovery and growth. As such, a closer look into the economic and social conditions, including macroeconomic variables, such as GDP growth, unemployment rates, inflation, and poverty levels, alongside social indicators like education and healthcare access, before, during, and after the COVID-19

pandemic is necessary for identifying sustainable remedies and charting a viable path to long-term economic recovery.

Cambodia's success in COVID-19 containment was exemplary (Dash, 2021). To control the economic impact of the global pandemic, on June 24, 2020, the Royal Government launched a new temporary social assistance program: "the Cash Transfer Program (CTP) for Poor and Vulnerable Households during COVID-19" (CTP-COVID) with temporary cash assistance using the Government's Identification of Poor Households Program (IDPoor) to support 560,000 poor and vulnerable affected households nationwide (Office of the Council of Ministers, 2020). As of January 2024, the cash transfer program has benefited around 710,000 households (more than 2.8 million people) in the country who hold IDPoor cards, with over US$1.3 billion in cash transfers across 42 rounds of payments (ILO, 2024).

Although the road to recovery was challenging, building a more resilient, inclusive, and sustainable economy should be the priority. The government's agenda should ensure a more adaptive, fair, and resilient society. Digitalization, e-commerce, and remote work create opportunities and challenges in a developing country like Cambodia based on its infrastructure. This impacted on several sectors, including education. In this context, creating a platform for debates and discussions on the strengths and challenges of the economy and lessons learned inform policies and future directions. In this direction, we organized international research symposiums, which led to the final production of this research-based book.

With research-based insights, this book presents thirteen chapters under two parts: COVID-19: The Economy and Government Interventions and COVID-19: The Society and Education and Government Interventions. The first part contains nine chapters focused on the economy and government intervention, including measuring the COVID-19 pandemic, bank performance, structural transformation, and the government's Cash Transfer Program. The second part focused on families, society, education, and government intervention. Together, the chapters present an impressive overview of our learning of the economy, society, and education from the COVID-19 crisis and moving toward a resilient, inclusive, and sustainable economy.

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PART I

COVID-19: The Economy, and Government Interventions

CHAPTER 1

COVID-19 Fallout and Building Forward Better in Cambodia

Alissar Chaker

1. INTRODUCTION AND BACKGROUND

The United Nations declared the COVID-19 pandemic a public health emergency and a socio-economic crisis quickly turning into a human rights crisis. The impacts of the pandemic were not limited to public health; it has also caused severe social and economic effects by increasing poverty, amplifying vulnerabilities and inequalities, and entrenching structural discrimination and exclusion. This was reflected in the unequal access to information and vaccination and the collateral impacts of measures taken to combat the propagation of the virus, including food insecurity, rising unemployment and poverty, increasing domestic and gender-based violence during confinement periods, and loss of schooling.

Like in other parts of the world, strict measures were implemented nationwide in Cambodia to contain the spread of the virus, including mobility restrictions, curfews, lockdowns, and closure of schools and businesses. The measures effectively limited the spread of the virus, kept the caseload under control, and kept the death toll at a relatively low level. However, on the other hand, they also posed a multifold challenge to Cambodian households, businesses, and the national economy. Informal workers, vulnerable households, and Micro, Small, and Medium enterprises (MSMEs) have struggled to survive and are still struggling to recover. The pandemic and the restrictive measures have had cumulative impacts on Cambodian society and the economy.

This chapter is based on studies and research undertaken by the United Nations Development Programme (UNDP), the Royal Government of Cambodia (RGC), and development partners. It presents key findings on the impacts of COVID-19 in Cambodia from four perspectives: 1) COVID-19 socio-economic impacts in 2020[1] and 2021[2], 2) Impacts of lockdown and curfew[3], 3) Impacts of COVID-19 on the Human Development Index[4], and 4) Impacts of COVID-19 on informal workers and MSMEs.[5] The prime aim of this chapter is to identify alternative and accelerated recovery pathways through simulations and socioeconomic scenario analysis. It is intended to contribute to policy discussions about options for accelerating a sustainable, inclusive, and resilient post-COVID recovery in the Kingdom.

2. COVID-19 SOCIO-ECONOMIC IMPACTS – 2020 AND 2021

In 2020, the health impact of COVID-19 in Cambodia was limited compared to other countries. The effect was more pronounced on the social and economic fronts. In 2021, the general situation was reversed; the health situation deteriorated with increasing community outbreaks, but economic growth was recovering, showing positive numbers. The socio-economic impacts were assessed under different scenarios.[6] The following sections summarize the key findings.

2.1 Impacts on the Gross Domestic Product (GDP)

The simulation model and the projected sectoral GDP information presented in the 2021 Macro-economic Framework of the Ministry of Economy and Finance (May 2021) were used to estimate the 2020 GDP values and other critical socio-economic data. The values capture the demand shock or COVID-19 shock. According to the estimation, the economy contracted by 3.1 percent, and poverty increased to 14.7 percent in 2020.

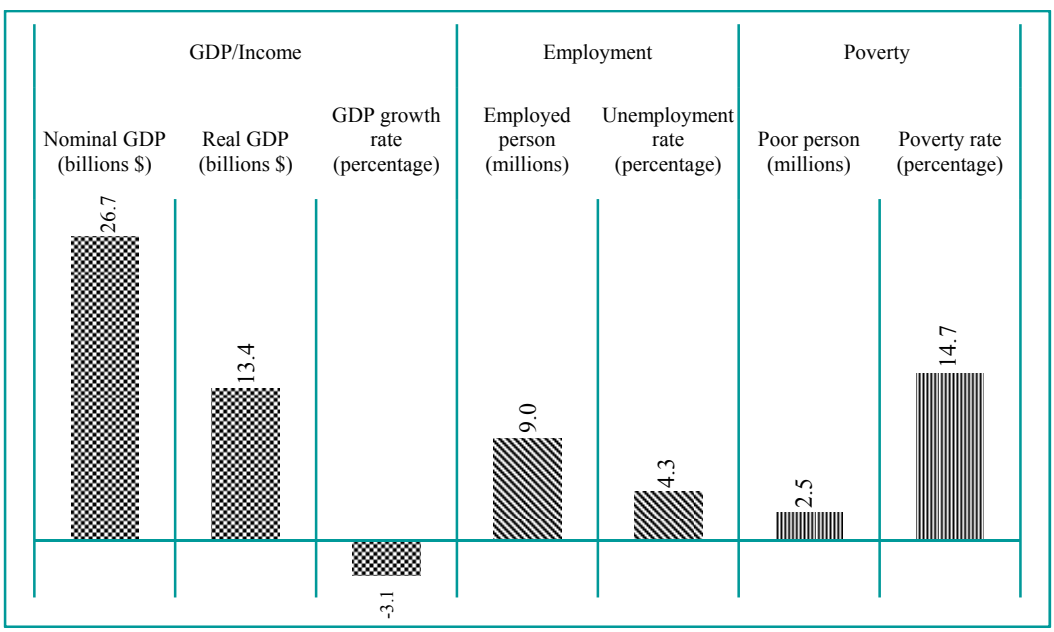

Figure 1.1: Simulated GDP, Employment, and Poverty in 2020 (COVID-19 Case)

Source: Based on data from the Ministry of Economy and Finance, Royal Government of Cambodia, and estimations by the authors.

Under the baseline scenario, the simulation shows GDP growing at 2.3 percent in 2021, including the social protection stimulus. The rate drops to 1.9 percent when

the social protection stimulus is excluded. The rate may decline to 1.7 percent under the moderate scenario or 1.3 percent under this scenario without the social protection stimulus.

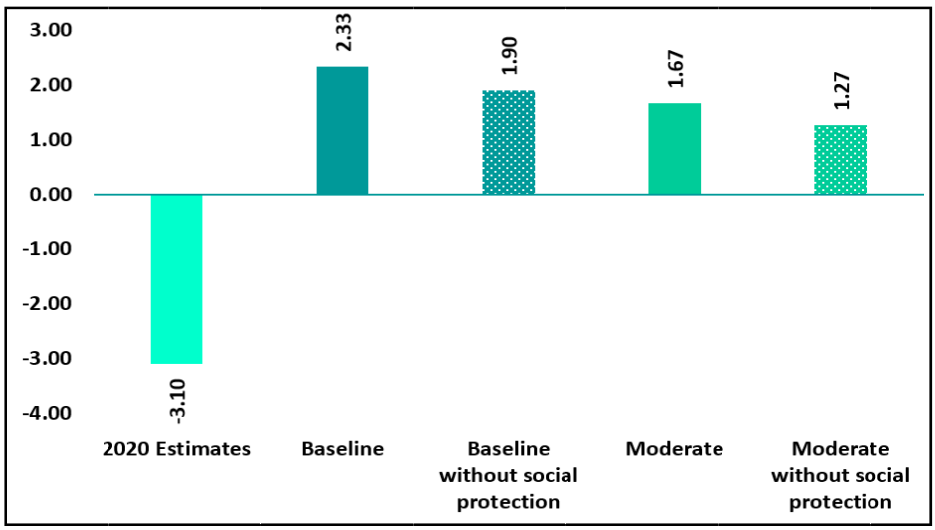

Figure 1.2: Simulated GDP Growth Rate under Recovery Scenarios in 2021 (Percentage)
Source: Cambodia Static Computable General Equilibrium Model (CGE) and Employment Module

2.2 Unemployment Key Findings

Unemployment increased substantially due to COVID-19 shocks. The 2020 estimated unemployment rate was 4.3 percent. In 2021, simulations showed that unemployment has improved with the economy's expansion. Under the recovery scenarios, including the social protection stimulus, unemployment rates may range from 2.9 percent under the baseline scenario to 3.3 percent under the moderate scenario. Without the stimulus, unemployment is expected to increase to 3.5 percent and 3.9 percent under the baseline and moderate scenarios, respectively.

Another important finding is that female workers have been disproportionately affected by the COVID-19 crisis due to their higher participation in industries such as garments/textiles and tourism. As shown in Table 1.1, in both the moderate and baseline scenarios, with and without social protection and other economic stimuli, the unemployment rate is higher for women than for men. Considering social protection and other forms of economic stimuli in place, the unemployment rate in 2021 is estimated at 2.6 percent for men and 3.2 percent for women in the baseline scenario, which is a 0.6 percentage point gender gap. In the moderate scenario, the gender gap in unemployment increases to 0.7, with an estimated rate of 3 percent for men and 3.7 percent for women. Slower economic recovery would thus widen the gender gap.

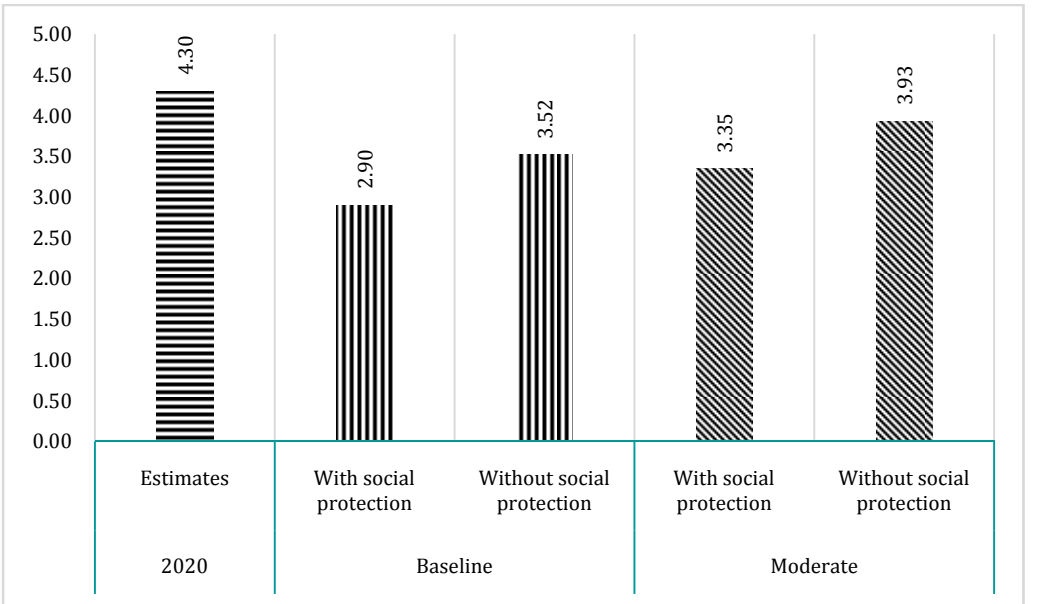

Figure 1.3: Simulated Employment Effects under the Recovery Scenarios (Percentage)

Source: Cambodia Static Computable General Equilibrium Model (CGE) and Employment Module

Table 1.1: 2021 Unemployment Rates by Gender (Percentage of Labour Force)

Country/ Gender	*Baseline*		*Moderate*	
	With Social Protection	*Without Social Protection*	*With Social Protection*	*Without Social Protection*
Cambodia	2.90	3.52	3.53	3.93
Men	2.63	3.29	3.00	3.60
Women	3.18	3.75	3.71	4.23

Source: Cambodia Static Computable General Equilibrium Model (CGE) and Employment Module

2.3 Poverty Key Findings

Sustained economic growth before the pandemic had significantly reduced poverty. A poverty module based on the 2019 Cambodia Socio-Economic Survey was used to assess poverty impacts in 2020 (pre-COVID-19) because of COVID-19 shocks and under the recovery scenarios. Projections based on the Social Accounting Matrix (SAM) 2020 household consumption data suggest a pre-pandemic simulated head-count poverty rate of 9.6 percent for 2020. While the poverty rate could have been higher, social protection and other economic stimuli have limited the negative fallout. The model estimates a poverty rate of 14.7 percent in 2020.

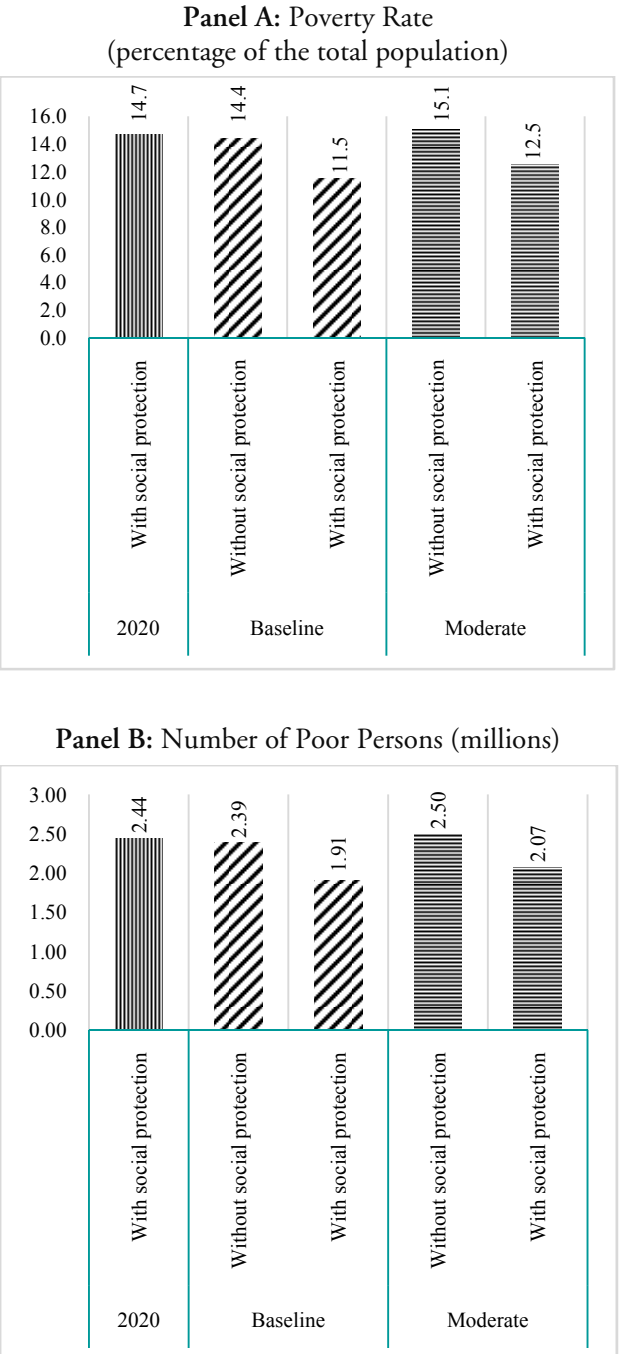

Figure 1.4: Simulated Poverty Impacts under the Baseline and Moderate Scenarios
Source: Cambodia Static Computable General Equilibrium Model (CGE) and Employment Module

Enhanced household consumption is expected to reduce poverty in Cambodia. Accordingly, under the baseline scenario, the poverty rate would decline from 14.7 percent in 2020 to 11.5 percent in 2021 due mainly to the social protection stimulus. Without social protection, the poverty rate may remain stubbornly high at 14.4 percent. Similarly, the poverty rate may decline from 14.7 percent in the baseline scenario to 12.5 percent under the moderate scenario with the social protection stimulus. If social protection is not considered, the poverty rate may increase to 15.1 percent.

3. IMPACTS OF COVID-19 LOCKDOWN AND CURFEW

To halt the spread of COVID-19, Cambodia imposed restrictions on movement. To offer data and analysis that can help find optimal measures of restrictions, UNDP Cambodia conducted some analysis to estimate the economic and social costs of lockdowns and curfews in Cambodia. The following summarizes the key findings of assessing the impacts of the COVID-19 lockdown and curfew.[7]

3.1 GDP Loss and Domestic Output Loss

As shown in Figure 1.5, the total weekly curfew cost for Phnom Penh, Siem Reap, and Preah Sihanouk added up to USD 33.9 million (weekly GDP loss), accounting for 7 percent of the weekly GDP. The lockdown measure amounted to USD

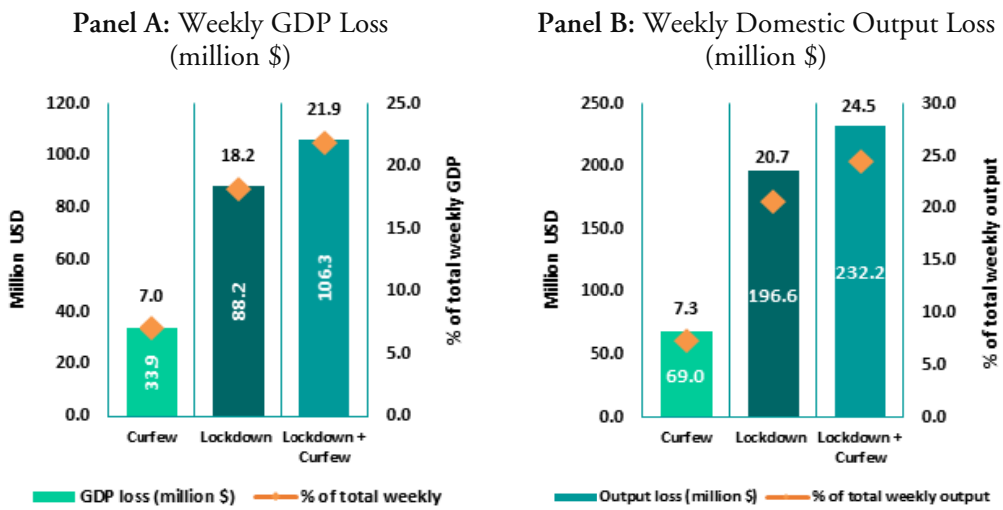

Figure 1.5: Curfew and Lockdown Cost (Economy-wide Modelling Approach)

Source: Based on data from the Ministry of Economy and Finance, Royal Government of Cambodia, and estimations by the authors.

88.2 million per week or 18.2 percent of the total weekly GDP for Phnom Penh alone. Simulations on the combined lockdown measure in Phnom Penh and curfew in the other two provinces estimated a loss of USD 106.3 million per week, or 21.9 percent of the total weekly GDP.

3.2 Households Reporting Income Reduction, Food Insecurity and Nutrition Deprivation

Based on the survey results, curfews and lockdowns impact different groups of people. The curfew measure, which has banned night-time businesses, affects most wage earners with an estimated reduction of wages from 30 percent to 50 percent. In comparison, the lockdown would cause the reduction of income of some wage-earners living in Phnom Penh by almost 100 percent. In addition to reducing income, the second biggest challenge is maintaining food security. In a survey assessing the impacts of the Cash Transfer Programme, UNDP Cambodia surveyed the main challenges faced by households during restrictions. The results showed that treatment households receiving the cash transfer and control households not included in the cash transfer group reported similar challenges. As shown in the figure below, 77.6 percent of the

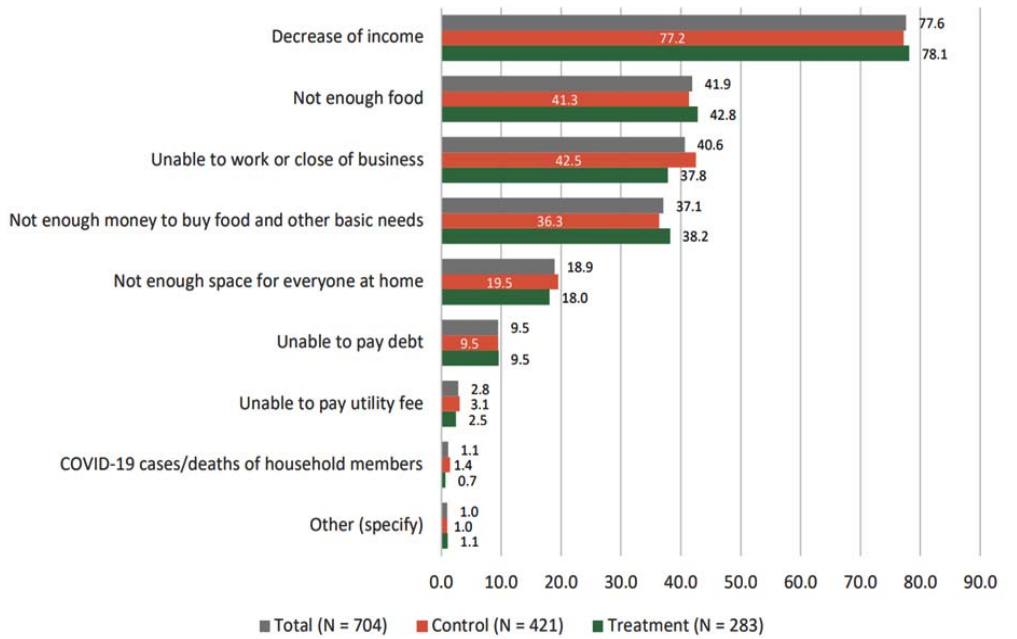

Figure 1.6: Challenges Faced by Surveyed Households during Lockdown/Curfew

Source: Socio-economic Impacts of the COVID-19 Cash Transfer Programme in Cambodia: Micro and Macro-level Evaluations, UNDP, Ministry of Economy and Finance, and National Social Protection Council

respondents reported a decreased income. 40.6 percent of the respondents mentioned they did not have enough food to eat, and 37 percent of all households did not have enough money to buy food and other basic needs for their members.

3.3 Temporary Job Loss

The estimated GDP losses under lockdown and curfew scenarios were linked with the employment module to simulate the number of temporary job losses. The number varies from 0.542 million under curfew to 1.12 million under lockdown scenario and 1.35 million under lockdown plus curfew scenario. Female workers are disproportionately affected by restrictions. They accounted for 53 percent of temporary job loss under the curfew scenario, 59 percent under the lockdown scenario, and 58.4 percent under the lockdown plus curfew scenario.

Table 1.2: Number of Temporary Job Loss (Million Persons)

Weekly Job Loss by Gender	*Curfew*	*Lockdown*	*Lockdown + Curfew*
Number of jobs lost (million persons)	0.542	1.120	1.350
Number of jobs lost for men (million persons)	0.254	0.558	0.561
Number of jobs lost for women (million persons)	0.288	0.662	0.789

Source: Economy-wide estimates and Employment Module

3.4 Schools Closure and School Dropout

In a study by UNDP Cambodia during the 2020–2021 academic school year, school closure amounted to 97 days or 33.5 percent of the public school calendar. During school closure, the Ministry of Education, Youth, and Sports introduced palliative measures such as television and radio education programmes for students without Internet access and remote digital education. However, due to limited Internet penetration in Cambodia, 30 percent of students could not access distance learning (MoEYS, 2021). Hence, the school dropout rate is expected to rise.

Table 1.3: Duration of School Closure and Household Internet Coverage in 2020

Country	*School Closure Date*	*School Reopening Date*	*Duration*	*Internet Coverage*
Cambodia	16 March 2020	2 November	97 days	47.9%

Source: Phnom Penh Post, 2020; Agence France-Presse, 2020; UNICEF, 2020; Bangkok Post, 2020; World Internet Statistics, 2020

4. COVID-19 IMPACT ON HUMAN DEVELOPMENT INDEX IN CAMBODIA

This analysis[8] employs the COVID-19-adjusted Human Development Index (HDI) framework to examine the possible effects of COVID-19 on human development progress across three main dimensions—income, health, and education—in Cambodia as well as in the three neighboring countries, namely, Lao PDR, Thailand, and Vietnam.

4.1 Projection of HDI under the Impacts of COVID-19

Simulations showed that COVID-19 is set to cause a drastic decline in HDI in all four countries. Cambodia is set to be hit hardest, with aggregate adjusted HDI declining by 3.93 percent from 0.594 in 2019 to 0.571 in 2020 (Table 1.4). For Cambodia, this is equivalent to the loss of progress made in human development over the past four years, back in 2016 (0.572).

Table 1.4: The Percentage Change in Projected 2020 HDI vs. 2019 HDI

Country	*2019 HDI*	*2020 pre-Covid est.*	*2020 HDI (Covid-adjusted)*	*Value Changes (at 2019 base)*	*Percentage Changes*
Cambodia	0.594	0.602	0.571	–0.0233	–3.93%
Lao PDR	0.613	0.620	0.597	–0.0159	–2.59%
Thailand	0.777	0.788	0.764	–0.0132	–1.69%
Vietnam	0.704	0.711	0.701	–0.0027	–0.39%

Source: UNDP Human Development Reports and the author's calculations

4.2 Reasons Behind

Cambodia's HDI contraction is attributable to two main factors. First, there was a drastic decline in the education index, equivalent to 11.11 percent, due to prolonged school closure (approximately 97 school calendar days) and aggravated by a low Internet base of 47.9 percent coverage (Table 1.3). Second, the income index dropped by 0.9 percent, primarily due to the global demand shocks of its key exports, especially in the garment, construction, and tourism sectors. In comparison, Lao PDR, Vietnam, and Thailand had shorter school closure times, although all countries, excluding Lao PDR, have had more cases of COVID-19 compared to Cambodia.

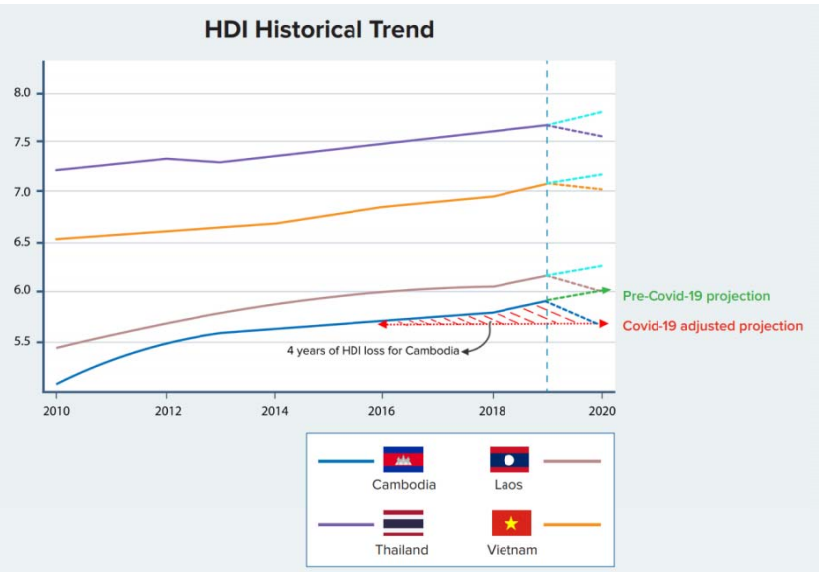

Figure 1.7: HDI Historical Trend in Cambodia, Lao PDR, Thailand, and Vietnam

Source: UNDP Cambodia, Projected impacts of COVID-19 on the 2020 Human Development Index in Cambodia and its neighbors.

Table 1.5: Projected Changes in the Education, Income, and Life Expectancy Indexes

Country	*2019*	*2020*	*Value Changes*	*Percentage Changes*
		Education Index		
Cambodia	0.484	0.430	–0.054	–11.11%
Lao PDR	0.481	0.444	–0.037	–7.77%
Thailand	0.682	0.656	–0.026	–3.86%
Vietnam	0.630	0.618	–0.012	–1.90%
		Income Index		
Cambodia	0.566	0.561	–0.005	–0.90%
Lao PDR	0.650	0.647	–0.003	–0.42%
Thailand	0.783	0.769	–0.014	–1.82%
Vietnam	0.651	0.653	0.002	0.38%
		Life Expectancy Index		
Cambodia	0.766	0.770	0.004	0.52%
Lao PDR	0.737	0.742	0.005	0.62%
Thailand	0.879	0.884	0.005	0.52%
Vietnam	0.852	0.854	0.002	0.27%

5. COVID-19 IMPACTS ON SMEs AND MSMEs

When COVID-19 hit the country in February 2020, UNDP Cambodia rolled out tracking surveys to assess the current and future socio-economic impacts of the COVID-19 pandemic on 500 MSMEs[9] across the country. The study employed a telephone interviewing panel (with replacement) involving four rounds of data collection. Below is the detailed sample size and date of each phase.

	Wave 1	*Wave 2*	*Wave 3*	*Wave 4*
Sample size	514	504	482	509
Date	Jul./Aug. 2020	Oct./Nov. 2020	Jan./Feb. 2021	Oct./Nov. 2021

Below are some key findings on the economic impacts of COVID-19 on formal and informal[10] MSMEs based on the survey:

5.1 Decreasing Demand and Profit

A large majority of formal and informal MSMEs across the four waves reported a decrease in demand for their products and services (with statistical significance, chi-square of 99 percent confidence level), especially in July/August 2020 and in September/October 2021 just after the country implemented strict lockdowns, curfews, and travel restrictions because of the 20 February 2021 community event (Figure 1.8).

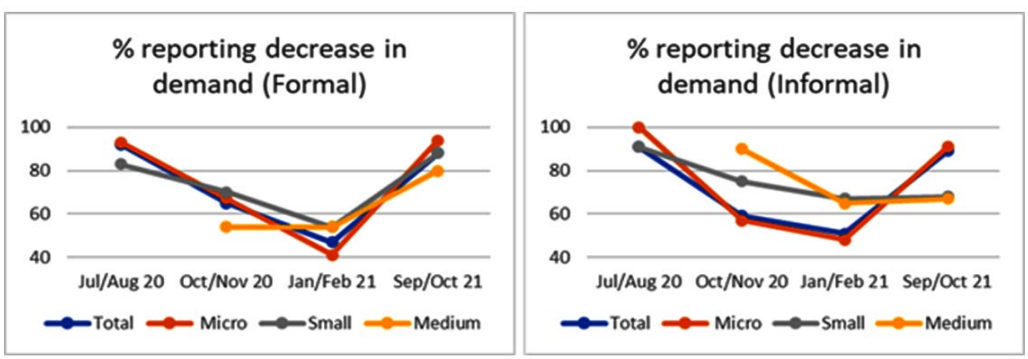

Figure 1.8: COVID-19 Impacts on Demand over Time

Statistically, there is no significant difference between formal and informal enterprises in reporting a profit reduction from Wave 1 to Wave 4 ($p>0.05$). Over 90 percent of the men and women-owned enterprises, both formal and informal, reportedly had a decline in profit in Wave 1. In contrast, the profit margin improved in Waves 2 and 3 before deteriorating again in Wave 4 (Figure 1.9).

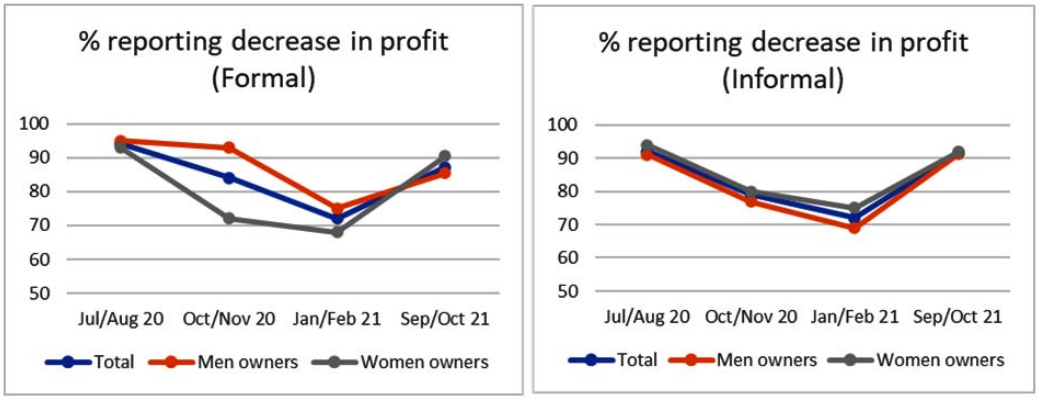

Figure 1.9: COVID-19 Impact on Profit over Time and by MSME Ownership (Gender)

5.2 Supply Chains

Statistically, there is no significant difference between formal and informal enterprises reporting supply issues over the observed periods ($p>0.05$). Between 42 percent and 64 percent of formal MSMEs reported having problems with supply (inputs and raw materials) in October/November 2020, when stricter travel restrictions were imposed after the country registered its first community outbreak. They also started suffering the impacts of supply chain disruptions from major economies such as China (Figure 1.10).

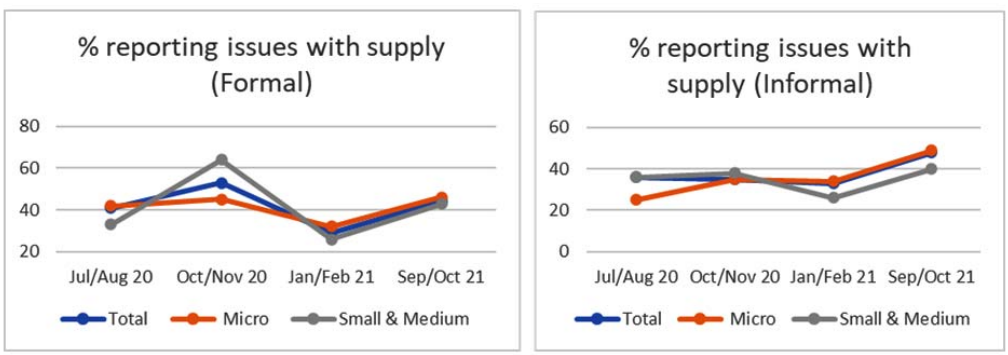

Figure 1.10: COVID-19 Impacts on Supply over Time

5.3 Debt Effects

The pandemic also affected the financial condition of firms by putting disproportionate pressure on their indebtedness. According to the survey, there is a significant difference between formal and informal enterprises when reporting debt (at a 99 percent confidence level) across the four waves. By September/October

2021, the level of debt among MSMEs increased. Approximately five in 10 formal MSMEs and four in 10 informal MSMEs were in debt. Meanwhile, formal MSMEs, especially micro-enterprises, were more likely to report an increase in debt between July/August 2020 and September/October 2021 than informal enterprises (Figure 1.11).

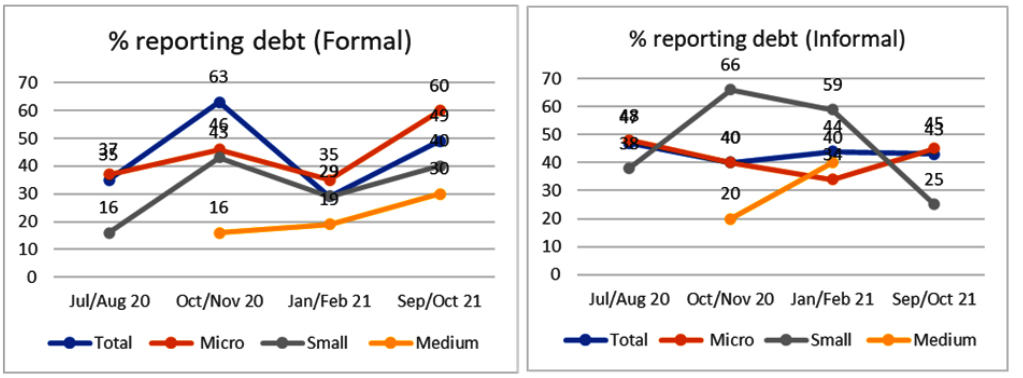

Figure 1.11: COVID-19 Impact on MSME Debt by MSME Size and Formality Status

5.4 Government Support and Coping Strategies of SMEs

Although no statistically significant differences exist in the nature and scale of impacts (demand, supply, and profit) between formal and informal enterprises, formal MSMEs are better positioned to respond to shocks. They did not have to adopt informal enterprises' widely applied negative coping strategies, such as taking additional loans, selling assets, negotiating with landlords on rental deferral, or temporarily closing businesses. Informal enterprises also reported challenges accessing new loans. While only five percent of formal enterprises reported receiving support from the government during the COVID-19 pandemic, mainly through partial/total salary subsidy, tax exemption, and utility and rental subsidy, none of the informal enterprises reported receiving any support over the same period. Overall, formal MSMEs appeared more resilient to COVID-19, with less debt uptake, more access to loans, and a higher likelihood of receiving government support, although the percentage is still low.

6. POLICY RECOMMENDATIONS

Macroeconomic simulations (scenarios with and without social protection) showed that social protection can reduce the speed of development gains and losses during COVID-19. As such, it is an effective way of mitigating the impact of COVID-19 on the poorest and preventing vulnerable households from sliding back into poverty. With national economies seeking to re-establish themselves, more comprehensive

and shock-responsive social protection system policies will be more critical than ever for future preparedness. The social dimension is an integral component of economic recovery, a component of fiscal stimulus that can boost aggregate demand and support the economy to bounce back.

Financial measures to support MSMEs could mitigate the impact of COVID-19 in the short run and promote greener, more inclusive, resilient, and diversified economic development in the medium to long run. MSMEs and workers in informal sectors are the most hit groups. Seventy percent of the population works in MSMEs; thus, there is a considerable demand for support to build resilience and capacity to survive in the disrupted business environment.

Based on the insights generated by the studies, the following recommendations are set forth:

1. Strengthen, adapt, and expand policies toward achieving universal access to social protection and promoting a more inclusive, resilient, and sustainable society. This would require balancing fiscal space and macroeconomic stability, efficiently using resources, harmonizing interventions, innovating, creating synergies, and accelerating digitalization.
2. Since women have been affected disproportionately during the pandemic, compounded by pre-existing inequalities and deprivations, a targeted effort is needed to establish a gender-sensitive social protection system, mainstreaming gender across existing programmes, and adopting specific policies for women and girls.
3. The simplification of business registration procedures would accelerate the formalization of MSMEs. Formal businesses showed greater resilience during the pandemic and had better chances to access funds and government support. In June 2020, the Cambodian government launched a business e-registration platform to reduce costs and expedite the registration of new businesses and enterprises. Currently, the registration takes an average of eight days instead of three to six months previously (Thou, 2020). However, after review, the platform targets well-operated and structured businesses rather than micro-small or informal business units. In this direction, a simplification of the registration platform is recommended.

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9. MSMEs in this study are identified as per the definition of the Royal Government of Cambodia's Sub-committee on SME Secretariat, as follows: 1) Micro-enterprises with fewer than 11 employees, 2) Small-enterprises with 11–50 employees, 3) Medium-enterprises with 51–100 employees, 4) Large-enterprises with >100 employees.
10. Formal enterprises are defined in this study as those that are (1) registered and (2) pay tax. Otherwise, they are considered as informal enterprises.

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CHAPTER 2

IFRS 9 Implementation and Bank Performance in Cambodia during the COVID-19 Pandemic

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1. INTRODUCTION

IFRS 9 Financial Instruments introduced an expected loss model for recognizing loan loss provisions that recognize loan losses earlier than required by the previous standard *IAS 39 Financial Instruments*. Commercial banks in Cambodia were required to follow IFRS 9 starting from January 1, 2019. This chapter analyzes the financial data of 25 banks for the years 2019–2023 to understand the impact of IFRS 9 expected credit losses on bank performance and loan loss provisions. The chapter also provides a historical overview of bank loan provisioning in Cambodia, which may help future researchers understand a shift in Cambodian bank performance subsequent to IFRS 9 adoption in 2019.

The global financial crisis of 2007–2009 saw the implosion of long-standing commercial banks, investment banks, and insurance companies, which had balance sheets inflated with worthless debt investments, especially securitized debt (Acharya *et al.*, 2009). The collapse of these financial institutions was partly due to over-investment in risky financial assets, the losses of which were not recognized by the fair value accounting used at that time (Acharya *et al.*, 2009). Earlier recognition of these losses could have supported institutions in shoring up capital (Gunn *et al.*, 2018).

It was in this context that the International Accounting Standards Board (IASB) developed *IFRS 9 Financial Instruments* to introduce an expected loss model in recognizing the impairment of financial assets, including loan assets. IFRS 9 and its treatment of loan impairment using an expected loss model was intended to recognize it earlier than the incurred loss model under *IAS 39 Financial Instruments* (IFRS Foundation, 2022; Bank for International Settlements, 2017). The introduction of IFRS 9 was welcomed as giving more timely information about the value and status of loan portfolios so that measures could be taken to shore up capital and avoid liquidity crises or credit downgrades that could pose an existential threat to financial institutions (Bank for International Settlements, 2017). However, the intention was

not a risk-averse prudential approach but an approach that "faithfully represents the economic phenomenon of expected credit losses" (IFRS Foundation, 2014).

Banks and financial institutions in Europe and other IFRS jurisdictions began following IFRS 9 for periods beginning on or after January 1, 2018. In contrast, banks in Cambodia were exempt from applying IFRS 9 until the National Bank of Cambodia required IFRS 9 implementation for periods beginning on and after January 1, 2019 (Ministry of Economy and Finance, 2016). This chapter examines the impact of Cambodia's transition to IFRS 9 on loan impairment recognition in Cambodia. The study compares the loan impairment loss recognition under IFRS 9 with the previous statutory loss recognition. Cambodia provides a unique opportunity to examine the impact of both IFRS 9 on the transition from statutory provisions and the application of IFRS 9 during a time of stress for banks, the 2020–2023 COVID-19 public health emergency a period of economic distress.

1.1 Regulatory and Accounting Context

Whereas some countries went through a process of harmonizing national accounting standards with IFRS, with many ultimately adopting IFRS, Cambodia never had its own national accounting or financial reporting standards before the initial introduction of IFRS by the National Accounting Council in 2003 (Ministry of Economy and Finance, 2003). In introducing IFRS to Cambodia, the Ministry of Economy and Finance of Cambodia signed a copyright agreement with the IFRS Foundation to use IFRS in Cambodia, renaming the IAS and IFRS standards "Cambodian Accounting Standards" (CAS) and "Cambodian International Financial Reporting Standards" (CIFRS). Individual CAS and CIFRS were copied from IAS and IFRS without modification. Still, in the initial 2003 requirement for large and medium-sized entities to follow CAS and CIFRS, only fifteen IASs were adopted for Cambodia (Ministry of Economy and Finance, 2003). In 2008, the number of standards was increased to twenty-two, two IFRS and twenty IASs (Table 2.1). These standards purposely omitted IAS 39, which the National Accounting Council concluded would have been challenging for financial institutions to implement and, therefore, an obstacle to introducing standards.

In 2009, the Cambodian Ministry of Economy and Finance, in its Ministry Order No. 68, adopted full and complete IFRS as CIFRS, including all amendments thereof (Ministry of Economy and Finance, 2009). In the same year, the Ministry of Economy and Finance, through Notification 097/09, stated that banks were required to follow full IFRS/CIFRS for periods beginning on or after January 1, 2012 (Ministry of Economy and Finance, 2009). However, in 2012, some banks were ready to implement full IFRS, whereas others were not. As a result, in July 2012, the

National Accounting Council decided to delay the implementation of IFRS/CIFRS for financial institutions until 2016 (Ministry of Economy and Finance, 2012). Again, in 2016, the National Accounting Council made a final delay in implementing CIFRS until periods beginning on or after January 1, 2019 (Ministry of Economy and Finance, 2016).

Table 2.1: Cambodian Accounting Standards in 2008 and their IFRS Equivalents

CAS/CIFRS	*IAS/IFRS*	*Title*
CAS 1	IAS 1	Presentation of Financial Statements
CAS 2	IAS 2	Inventories
CAS 7	CAS 7	Accounting Policies, Changes in Accounting Estimates and Errors
CAS 8	CAS 8	Accounting Policies, Changes in Accounting Estimates and Errors
CAS 10	CAS 10	Events after Balance Sheet Date
CAS 11	CAS 11	Construction Contracts
CAS 12	CAS 12	Income Taxes
CAS 16	CAS 16	Property, Plant, and Equipment
CAS 17	CAS 17	Leases
CAS 18	CAS 18	Revenue
CAS 21	CAS 21	The Effects of the Changes in Foreign Rates
CAS 23	CAS 23	Borrowing Costs
CAS 24	CAS 24	Related Party Disclosures
CAS 27	CAS 27	Consolidated and Separate Financial Statements
CAS 37	CAS 37	Provisions, Contingent Liabilities and Contingent Assets
CAS 38	CAS 38	Intangible Assets
CAS 40	CAS 40	Investment Property
CAS 41	CAS 41	Agriculture
CFRS 4	CFRS 4	Insurance Contracts
CFRS 7	IFRS 7	Financial Instruments: Disclosures

Sources: Order 97/09 and Order 221, Ministry of Economy and Finance, 2008

Since January 1, 2019, all commercial banks in Cambodia have followed full CIFRS, though some early adopted CIFRS starting in 2018. Before 2018 and 2019, commercial banks in Cambodia implemented the twenty-two CAS and CIFRS

(Table 2.1), which excluded IAS 39. In the absence of IAS 39 or equivalent, commercial banks accounted for loans and loan impairment in accordance with the National Bank of Cambodia statutory loan provisioning.

The 2008 global financial crisis was a catalyst for the National Bank of Cambodia to increase statutory provisions. In 2000, statutory provisions for bank loans had been set at 20 percent of sub-standard loans, 50 percent of doubtful loans, and 100 percent of "loss" loans (National Bank of Cambodia, 2000). Just two years later, the National Bank of Cambodia decreased these provisions. From 2002 until 2009, the statutory provisions were 10 percent of substandard loans, 30 percent of doubtful loans, and 100 percent of "loss" loans, subject to adjustments for the value of collateral (National Bank of Cambodia, 2002). However, the statutory provisions dramatically increased in 2009 (Table 2.2) as required by the 2009 National Bank of Cambodia *Order on Asset Classification and Provisioning in Banking and Financial Institutions* and the 2017 National Bank of Cambodia *Order on Credit Risk Grading and Impairment Provisioning*. National Bank of Cambodia Guidance No. 001, implementing the 2017 order, set the statutory non-performing loan provisions as a fixed percent of loans according to days past due (Table 2.2) (National Bank of Cambodia, 2017). These 2017 provision categories and amounts were unchanged from the 2009 statutory provision requirements. The 2017 provision categories remain in force and are used for prudential reporting, capital requirements, and tax purposes.

Table 2.2: National Bank of Cambodia Statutory Provisions for Commercial Bank Lending

	Long term credit original term of more than one year Ministry Order 017–344, Article	***Short term credit original term of one year or less Guidance No. 001, Article 7***	
Statutory Classification Grade	***Days Past Due***	***Days Past Due***	***Regulatory Provision***
Normal	Less than 29 days	Less than 15 days	1% of gross loans
Monitoring	30–89 days	15 to 30 days	3% of gross loans
Substandard	90–179 days	31 to 60 days	20% of gross loans
Doubtful	180–359 days	61 to 90 days	50% of gross loans
Loss	360+ days	91 days and above	100% of gross loans

Source: National Bank of Cambodia, 2009; National Bank of Cambodia, 2017

From 2019 onwards, commercial banks discontinued using the National Bank statutory provisioning to determine their loan impairment expense for accounting

purposes, replacing it with the requirements of IFRS 9. However, the statutory provision is still an important metric used by the National Bank of Cambodia. The National Bank of Cambodia uses the statutory provision as a basis for the minimum capital required of banks; if the provision increases, commercial banks also must maintain or contribute additional capital. The tax authorities also use the National Bank of Cambodia statutory provision to determine taxable income. Cambodian Ministry of Economy and Finance Order 578 on Income Tax, dated September 19, 2024, Article 27, allows provisions for bad debts to be deducted from taxable income for substandard, doubtful, and written-off loans only in accordance with the National Bank of Cambodia regulations (Ministry of Economy and Finance, 2024). Thus, because CIFRS 9 basis loan impairment expense is not used by the bank regulator or the tax authorities, the main role of CIFRS 9 basis loan impairment expense is communicating performance and financial position to management, shareholders, depositors, and the public.

IFRS 9 requires a holistic assessment of the risk and recoverability of a loan, in contrast to the statutory provisioning, which only looks at days past due. As per IFRS 9, paragraph 4.1.2, loans issued by a commercial bank are accounted for at amortized costs if the bank intends to collect the contractual cash flows of principal and interest (IFRS Foundation, 2025).

Table 2.3: IFRS 9 Expected Credit Loss (ECL) Allowance for Commercial Bank Lending

Loan Classification	*ECL Allowance*
Credit risk has not significantly increased since the initial recognition	12-month expected credit losses (i.e., loss given default within 12 months)
Credit risk has significantly increased since the initial recognition	Lifetime expected credit losses (i.e., loss given default over the life of the loan)

Source: IFRS 9, paragraphs 5.5.5 and 5.5.3, IFRS Foundation, 2025

The two classifications of loans under IFRS 9 focus on changes in credit risk, which is forward-looking. The allowance measurement is also forward-looking, requiring lenders to estimate the probability of default. IFRS 9, paragraph 5.5.11, directly contrasts with the approach required for statutory provisions, stating that "an entity cannot solely rely on past due data" (IFRS Foundation, 2025). The guidance for measuring expected credit losses in IFRS 9 Appendix B notes a broad range of indicators of impairment, including changes in macroeconomic factors (paragraph B5.5.14) and collateral type and value (paragraph B5.5.5).

The expected credit loss approach under IFRS 9 was a significant methodological and conceptual departure from the incurred loss method under the previous standard,

IAS 39 Financial Instruments: Recognition and Measurement. Under IAS 39, loans were categorized as "loans and receivables," accounted for using the amortized cost method. Loans and receivables under IAS 39 were impaired only when there was "objective evidence of impairment as a result of one or more events" (IAS 39, paragraph 59). IAS 39 gave examples of objective evidence, including default, concessions to borrowers, financial difficulty of the issuer, and breach of contract (IAS 39, paragraph 59). Whereas IFRS 9 requires anticipation of future default, the objective evidence required by IAS 39 emphasizes the borrower's current and past financial difficulty. Indeed, the intention of IFRS 9 was to recognize impairment losses sooner rather than later.

The next section of this chapter reviews relevant literature and develops hypotheses. This is followed by the presentation of the study methodology, results, and discussion to understand the shift in Cambodian bank performance that occurred after the adoption of the IFRS 9 in 2019.

2. LITERATURE AND HYPOTHESES

IFRS 9 Financial Instrument was designed to recognize loan impairment earlier than later compared to IAS 39. The effects of the transition to IFRS 9 have been studied among European banks. In the United Kingdom, the transition to IFRS 9 resulted in banks increasing loan provisions by 16–58 percent but had less impact on recognition of loan impairment expense (Deloitte, 2019). A study of 107 European banks also identified a significant increase in loan loss provisions on the transition to IFRS 9 (Neisin & Schulte-Mattler, 2021). This is consistent with an international study of 149 listed banks in G20 countries, which found credit impairment to be larger and more conservative under IFRS 9 (Lima Rebeiro *et al.*, 2024).

However, Cambodia's transition to IFRS 9 was unique. In contrast to other countries that had followed a less conservative IAS 39 prior to IFRS 9, Cambodia had been following more strict statutory loan loss provisions, which required significant provisions regardless of any recovery through the sale of collateral (National Bank of Cambodia, 2017). On transition to IFRS 9, Cambodian banks could, for the first time, consider collateral and future expected collections when determining loan impairment expenses, reducing the size of impairment expenses. This leads to our first hypothesis:

H1: Commercial bank loan impairment expense is lower under IFRS 9 than under the National Bank of Cambodia statutory impairment expense.

Cambodian banks implemented IFRS 9 in 2019, which was followed by the COVID-19 pandemic starting in 2020. A commercial bank with poor performance

in a challenging period, such as the COVID-19 pandemic, might be pressured to manipulate its loan impairment expense to increase profits. Manipulation of loan loss provisions under IFRS 9 is possible due to the use of judgment required. A study of 5,147 listed and unlisted European banks found that during the COVID-19 pandemic, banks manipulated their loan loss provisions (Allini *et al.*, 2023). The authors also found greater manipulation among listed banks (Allini *et al.*, 2023).

Most commercial banks in Cambodia publish public audited financial reports. A loss or significant drop in profits could attract negative publicity and put a bank's financial stability into question, making it challenging to attract depositors. Therefore, banks may be under competitive pressure to show higher profits to project financial soundness and give confidence to potential depositors and clients.

However, in contrast to banks in other countries, such as those in Europe, IFRS 9 expected credit losses of banks in Cambodia have little effect on regulatory capital requirements. Regulatory bank capital in Cambodia is based on the higher of the IFRS 9 loan loss provision and statutory loan loss provision. The statutory loan loss provision is usually higher, so in this case, the size of the IFRS 9 loan loss provision does not influence the need for a bank to raise additional capital. There would be little motivation for a bank to decrease its loan losses for these purposes.

Also, the IFRS 9 expected credit losses of Cambodian banks do not affect taxable profit. Cambodian tax law only allows for the deduction of the National Bank of Cambodia statutory loan impairment losses. In contrast, the IFRS 9 loan impairment expense cannot be deducted from taxable profit. Thus, there is no motivation for a bank to increase its IFRS 9 loan losses for tax purposes.

Given the competitive advantage of showing a better performance by recognizing smaller IFRS 9 loan loss provisions, and given the absence of motivation to recognize larger IFRS 9 loan loss provisions, we predict the management of IFRS 9 loan loss provisions to increase profits, and we develop the following two hypotheses:

H2: The ratio of loan impairment expense to total gross loans receivable is smaller in years of declining profits.

H3: A decline in bank profits leads to a decrease in the ratio of loan impairment expense to total gross loans receivable.

3. METHODOLOGY

3.1 Data Sources and Sample

The study uses financial information from two main sources. First, it utilizes the information about individual commercial bank statutory loan impairment expenses

as reported in the annual supervision reports of the National Bank of Cambodia. Secondly, it collects IFRS-based financial information from the public financial reports of commercial banks in Cambodia. To ensure comparability and completeness, the study includes only commercial banks that operated in Cambodia for the years 2019–2023, and 2019 was chosen as the starting year because it is the first year that IFRS 9 was mandatory for all commercial banks. The final year, 2023, was selected because, at the time of this study, most commercial banks had published their 2023 annual financial report, but few had made available their 2024 financial report.

Of the population of 58 licensed commercial banks in Cambodia as per the 2023 Supervision Report of the National Bank of Cambodia, several banks were omitted because they had changed legal form, which affected their financial reporting basis; several were omitted because they commenced lending activities only after 2019, and several were omitted because they did not publicly disclose financial reports for their Cambodian operations for one or more years (Appendix 1). After omitting banks with incomplete or incomparable data, the study was left with a final 25 commercial banks with both financial reporting data and National Bank non-performing loan data available for analysis for the period 2019–2023.

3.2 Data Analysis

To test hypothesis H1, we first conducted a paired samples two-tailed test of means to determine whether the IFRS 9 impairment is significantly lower than the statutory impairment for the years 2019–2023. However, due to the non-normality of the data, we proceeded to conduct a Wilcoxon-signed rank test. To test hypothesis H2, we

Table 2.4: Regression Variables

Dependent Variable	
Loan impairment ratio	The ratio of IFRS 9 basis loan impairment expense divided by total gross loans receivable.
Independent Variables	
Growth in profit before tax and loan impairment	Annual growth measured as: (profit before tax and loan impairment expense for the year/profit for the previous year) – 1
GDP growth	Real GDP growth for the year, as reported by the International Monetary Fund
Loan growth	Growth in gross loans receivable
Statutory non-performing loans	Total non-performing loans, as reported by the National Bank of Cambodia supervision reports

again performed a paired samples two-tailed test of means for the years 2019–2023. Finally, to test hypothesis H3, we conducted ordinary least squares regression with the variables shown in Table 2.4 for each commercial bank for each of the years 2019, 2020, 2021, 2022, and 2023 omitted for the reason described above. We utilized SPSS to conduct data analysis.

4. RESULTS

To test the first hypothesis, we conducted a one-tailed pair samples t-test to determine whether the IFRS 9 impairment expense for commercial banks is significantly lower than the statutory impairment expense for the same years (Table 2.5). The results show that the IFRS 9 impairment expense was significantly lower, with an average of $5.47 million, compared to the statutory impairment expense that had a mean value of $7.34 million.

Table 2.5: H1 Paired Test of Means Comparing IFRS 9 Impairment Expense and Statutory Impairment Expense

Variable	*Mean (USD)*
IFRS 9 Impairment Expense (n = 125)	$4,842,169
Statutory Impairment Expense (n = 125)	$9,861,438
t-score	–3.894
Two-tailed p-value	0.001***

Note: ***Significant at a 1 percent level (two-sided)

However, A normality assessment was conducted using the Kolmogorov-Smirnov (K-S) and Shapiro-Wilk tests, with results indicating that both IFRS impairment and NBC impairment significantly deviated from normality. Therefore, a Wilcoxon Signed-Rank Test was used to compare IFRS and statutory impairment expense (Table 2.6). The Wilcoxon Signed-Rank Test assessed whether the median difference between the two impairment measures was significantly different from zero. Results

Table 2.6: Related Samples Wilcoxon Signed Rank Test

Total N	125
Test Statistic	5,830
Standard Error	671
Standardized Test Statistic	4.663
Asymptotic Sig. (2-sided test)	<.001

indicated a statistically significant difference between IFRS 9 impairment expense and the statutory impairment expense, implying that banks report impairment expenses significantly differently under IFRS 9 compared to statutory impairment requirements.

To test hypothesis H2, we conducted an independent samples t-test comparing the average loan impairment ratio in years of declining profits with the average loan impairment ratio in years of increasing profits. The loan impairment ratio was calculated using IFRS 9 basis figures reported in the public audited financial reports of the commercial banks. The measure for profit growth also used the IFRS 9 basis figures from the public financial reports of the banks, measured as the growth in profit before tax and loan impairment in a given year compared to the previous year. If the profit increased compared to the previous year, we classified the figures for that year as a "year of increasing profit," if the profit declined, we classified the figures for that year as a "year of declining profits." There were 51 cases of an annual decline in profit between 2019–2023 and 74 cases of a yearly increase in profit between 2019–2023.

The average loan impairment ratio in years of declining profits was significantly higher than in years of increasing profits (Table 2.7). As our hypothesis was directional, a one-sided p-value was used, and the result was significant at a 1.3% significance level.

Table 2.7: Average Loan Impairment Ratio in Years of Declining Profits Compared to Average Loan Impairment Ratio in Years of Increasing Profits

Variable	*Mean*
Loan impairment ratio in years of declining profits (n = 51)	0.8122%
Loan impairment ratio in years of increasing profits (n = 74)	0.3041%
t-score	2.275
One-sided p-value	0.013

Note: Equal variances are not assumed because Levene's test is 7.585 with a significance of .007.

To test hypothesis H3, we conducted multiple regression with the loan impairment ratio (LIR) as the dependent variable (Table 2.8). The results show a consistent and strong significant negative relationship between growth in profit and the loan impairment ratio, contradicting our proposed hypothesis.

Table 2.8: Regression Analysis with Loan Impairment Ratio (LIR) as the Dependent Variable

Variables	*Model 1*	*Model 2*	*Model 3*	*Model 4*
Growth in profit before tax and loan impairment	–0.271***	–0.260***	–0.261***	–0.262***
GDP growth		–0.224	–0.225*	–0.224*
Loan growth			0.023	0.023
Statutory non-performing loans				–0.007
Constant	0.538	0.762	0.750	0.754
Observations	125	125	125	125
R-squared	0.074	0.123	0.124	0.124
Adjusted R Square	0.066	0.109	0.102	0.095
VIF[†]	1.000	1.003	1.011	1.017
Regression model p-value	<.001	<.001	<.001	0.003

Note: ***Significant at a 1 percent level, **Significant at a 5 percent level, *Significant at a 10 percent level

[†]The VIF value is the largest VIF value across all independent variables.

5. DISCUSSION AND CONCLUSION

We find that IFRS 9 improved bank profitability in line with our expectations. The results of this study confirm our hypothesis (H1) that IFRS 9 resulted in lower loan impairment expense, making banks more profitable than if they had recognized the higher statutory loan impairment expense. This is in contrast to the experience of other countries, where the transition to IFRS 9 resulted in larger loan loss provisions. The reason is likely the unique regulations in Cambodia, that Cambodian banks did not transition to IFRS 9 from IAS 39 but instead transitioned from a more strict statutory requirement for recognizing loan loss provisions. Therefore, the transition to IFRS 9 improved the reported profits of banks in Cambodia.

Contrary to expectations, we did not find evidence of manipulation of IFRS 9 loan loss provisions despite the financial pressure on banks during the economic slowdown caused by the COVID-19 pandemic. Our analyzes contradicted our hypotheses H2 and H3, that banks managed IFRS 9 loan loss provisions to show better performance during periods of declining profit. We found no evidence of manipulating IFRS 9 loan loss provisions to show a better profit. This may be due to Cambodian banks' commitment to compliance, adequate regulatory supervision by the National Bank of Cambodia, and the influence of effective independent audits by

competent, licensed audit firms. In addition, the supposed competitive advantage of reporting higher profits may be limited.

An interesting observation from our study is that the statutory non-performing loan loss provision is negatively correlated with the loan impairment ratio calculated in accordance with IFRS 9. This suggests that the statutory method of calculating loan loss provisions may be inaccurate and, therefore, inefficient. The statutory method for calculating loan loss provisions should be further studied for improvement. Because the statutory provision is used for setting capital requirements, an improvement in the measurement of the statutory loan loss provision will also make bank capital more efficient, leading to economic benefits.

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APPENDIX 1

List of All 2023 Licensed Commercial Banks in Cambodia

No.	*Bank Name*	*Included in Study*	*Reason for Exclusion from the Study*
1.	ACLEDA Bank Plc.	Yes	
2.	Advanced Bank of Asia Limited	Yes	
3.	Bangkok Bank, Cambodia Branch	Yes	
4.	Bank of China (Hong Kong) Limited Phnom Penh Branch	Yes	
5.	Booyoung Khmer Bank	Yes	
6.	BRED Bank (Cambodia) Plc.	Yes	
7.	Cambodia Asia Bank Ltd.	Yes	
8.	Cambodian Public Bank Plc.	Yes	
9.	Canadia Bank Plc.	Yes	
10.	Cathay United Bank (Cambodia) Co., Ltd.	Yes	
11.	CIMB Bank Plc.	Yes	
12.	Foreign Trade Bank of Cambodia	Yes	
13.	Hong Leong Bank (Cambodia) Plc	Yes	
14.	J Trust Royal Bank Plc.	Yes	
15.	Maybank (Cambodia) Plc.	Yes	
16.	MB Bank (Cambodia) Plc.	Yes	
17.	Mega International Commercial Bank Co., Ltd Phnom Penh Branch	Yes	
18.	Phillip Bank Plc.	Yes	
19.	Prince Bank Plc.	Yes	
20.	RHB Bank (Cambodia) Plc.	Yes	
21.	Saigon Thuong Tin Bank (Cambodia) Plc.	Yes	

No.	*Bank Name*	*Included in Study*	*Reason for Exclusion from the Study*
22.	Saigon-Hanoi Bank Cambodia Plc.	Yes	
23.	Sathapana Bank Plc.	Yes	
24.	Shinhan Bank (Cambodia) Plc.	Yes	
25.	Union Commercial Bank Plc.	Yes	
26.	Agricultural and Rural Development Bank	No	100% government-owned bank; was excluded from the NBC supervision report for the years 2018 and 2019
27.	Cambodian Commercial Bank Plc.	No	Absence of NBC supervision report NPLs in 2019
28.	Vattanac Bank	No	Absence of NBC supervision report NPLs in 2019
29.	B.I.C (Cambodia) Bank Plc.	No	Absence of NBC supervision report NPLs in 2019–2020
30.	Heng Feng (Cambodia) Bank Plc.	No	Absence of NBC supervision report NPLs in 2019–2023
31.	Alpha Commercial Bank Plc.	No	Absence of NBC supervision report NPLs in 2019–2023
32.	CCU Commercial Bank Plc.	No	Absence of NBC supervision report NPLs in 2019–2023
33.	Branch of Mizuho Bank, Ltd.	No	Absence of NBC supervision report NPLs in 2019–2023
34.	Chip Mong Commercial Bank Plc.	No	Absence of NBC supervision report NPLs in 2019, 2020
35.	ICBC Limited Phnom Penh Branch	No	Absence of NBC supervision report NPLs in 2019, 2020
36.	Chief (Cambodia) Commercial Bank Plc.	No	Absence of NBC supervision report NPLs in 2019, 2020
37.	Branch of Industrial Bank of Korea	No	Absence of NBC supervision report NPLs in 2019, 2020, 2021
38.	Asia-Pacific Development Bank Plc.	No	Absence of NBC supervision report NPLs in 2019, 2020, 2021
39.	Heng He (Cambodia) Commercial Bank Plc.	No	Absence of NBC supervision report NPLs in 2019, 2020, and 2021 and incomplete data financial information from annual reports

No.	*Bank Name*	*Included in Study*	*Reason for Exclusion from the Study*
40.	Small and Medium Enterprise Bank of Cambodia Plc. "SME Bank"	No	Absence of NBC supervision report NPLs in 2019, 2020, and 2021 and unavailable financial data from the bank annual report
41.	Wing Bank (Cambodia) Plc.	No	Absence of NBC supervision report NPLs in 2019 and 2020
42.	Taiwan Cooperative Bank, Phnom Penh Branch	No	Absence of NBC supervision report NPLs in 2020, 2021
43.	Krung Thai Bank Public Co., Ltd Phnom Penh Branch	No	Absence of NBC supervision report NPLs in 2022 and 2023
44.	Branch of Kasikorn Bank Public Company Limited	No	Absence of NBC supervision report NPLs in 2019, 2020, 2023
45.	KB Prasac Bank Plc.	No	Complete comparable data not available due to bank merger in 2022
46.	DGB Bank Plc.	No	Explanatory notes disclosed expected credit losses not available in the public financial report
47.	Woori Bank (Cambodia) Plc.	No	Lack of reported loan impairment provisions in 2019, 2020
48.	Bank for Investment and Development of Cambodia Plc.	No	No disclosure of expected credit loss provision in public financial reports for the years 2018 and 2019
49.	Cambodia Post Bank Plc.	No	Public financial reports for 2018 and 2019 are not available
50.	First Commercial Bank Phnom Penh Branch	No	Public financial reports for Cambodian banking operations are not available
51.	Phnom Penh Commercial Bank Plc.	No	Public financial reports unavailable for the years 2019 – 2021
52.	Rui Li (Cambodia) Bank Plc.	No	Public financial reports unavailable for the years 2019–2023
53.	Vietnam Bank for Agriculture and Rural Development Cambodia Branch	No	Public financial reports unavailable for the years 2019–2023
54.	Bridge Bank Plc.	No	The bank became a commercial bank in 2022

No.	*Bank Name*	*Included in Study*	*Reason for Exclusion from the Study*
55.	Hattha Bank Plc.	No	The bank received its commercial banking license in 2020
56.	SBI Ly Hour Bank Plc.	No	The bank was licensed in 2019
57.	Panda Commercial Bank Plc.	No	The bank was licensed in 2020
58.	Oriental Bank Plc.	No	The bank was licensed in 2022

Sources: Supervision Report, National Bank of Cambodia, 2016; Supervision Report, National Bank of Cambodia, 2018; Supervision Report, National Bank of Cambodia, 2020

CHAPTER 3

Cambodia's Cash Transfer Program and the Laid-off Workers' Economic Priorities in the Post-COVID-19 Context: A Labor Market Assessment

Tapas R. Dash

1. INTRODUCTION

The outbreak of the COVID-19 pandemic had a devasting effect on the global economy. The rapid spread of the virus led to the disruption of supply chains and freezing demand, limiting the flows of travel, trade, and investment (Organization for Economic Co-operation and Development [OECD], 2020). The lockdown measures implemented across nations to control the spread of the pandemic triggered supply and demand shocks and posed severe challenges for people with low incomes (Dash & Dash, 2021). Almost 1.6 billion informal economy workers, out of a worldwide total of two billion and a global workforce of 3.3 billion, suffered massive damage to their capacity to earn a living (International Labor Organization [ILO], 2020). To mitigate the socioeconomic impact of the COVID-19 pandemic on the livelihoods of the poor and vulnerable, countries diversified their measures, and social assistance played a crucial role in rescuing targeted people. The social assistance program is short-term in general, and due to the unpredictable nature of the crisis, the extension over time was uncertain. To meet the needs of the people during the crisis, several countries expanded their social assistance programs in general and cash transfers in particular. Globally, over 2020–2021, cash transfers reached 1.36 billion people, which means one out of six people in the world received at least one cash transfer payment (Gentilini, 2022). In addition to the unprecedented scale of cash transfers, many beneficiaries' profiles show that 203.7 million workers received unconditional cash transfers, including 184 million in the informal sector and 19.7 million in formal jobs (Gentilini *et al.*, 2022).

To control the economic impact of COVID-19, on June 24, 2020, the Royal Government launched a new temporary social assistance program: "the Cash Transfer Program (CTP) for Poor and Vulnerable Households during COVID-19" (CTP-COVID) with temporary cash assistance using the Government's Identification of Poor Households Program (IDPoor) to support 560,000 poor and vulnerable

affected households nationwide (Office of the Council of Ministers, 2020). On the official launch of the CTP, the Cambodian prime minister announced that "the Royal Government's main goal in launching this program is to improve the livelihoods of the poor and vulnerable people affected by COVID-19, including unemployed or marginalized people who have fallen into poverty" (Office of the Council of Ministers, 2020). As provisioned in CTP, any IDPoor equity cardholder registered with an administrator at the commune level received an account from an e-payment provider. Households that received temporary cash assistance include a base cash transfer per household of US$20 in rural areas plus an additional US$4 per household member and US$30 for urban households per month plus US$7 per household member. Additional benefits for households include households living in extreme poverty, the elderly, children, persons with disabilities, and people living with HIV/AIDS (Pagnathun *et al*., 2021). To minimize the economic shock for poor households, the Royal Government developed a US$1 billion package, including a US$300 million cash transfer program (Pagnathun *et al*., 2021). According to the Ministry of Social Affairs, Veterans and Youth Rehabilitation (MoSVY), within three years, the Royal Government disbursed US$ 1,056 million for its cash transfer program to support 704,535 poor and vulnerable households hit hard by the COVID-19 crisis (Ministry of Information, 2023). Although US$ 25 million was initially estimated as the monthly spending for this program (Office of the Council of Ministers, 2020), finally, the Government dishes out an average of around US$ 35 million a month for this need-based social assistance program (Mathew, 2023). As of January 2024, the cash transfer program has benefited around 710,000 households (more than 2.8 million people) in the country who hold IDPoor cards, with over US$1.3 billion in cash transfers across 42 rounds of payments (ILO, 2024).

The large-scale CTP implemented by the Government of Cambodia to effectively distribute cash to poor and vulnerable households during and after the COVID-19 pandemic adhered to the three principles of equity-equality-efficiency (Chhoeung *et al*., 2022). During its implementation stage, the Royal Government successfully overcame several challenges, including many people waiting in line to withdraw cash. The technical working group formed and worked under the guidance of the Economic and Finance Policy Committee, led the implementation process; coordinated among local governments, local councils, agencies, and the poor and needy; reviewed the IDPoor database; established the digital payment system; and trained local government staff.

While the COVID-19 pandemic impacted the Cambodian economy unprecedentedly, triggering the first economic contraction in 25 years, which contracted the economy by 3.1 percent in 2020 (World Bank, 2021), Cambodians faced several economic and financial challenges, and the poor and vulnerable were the worst sufferers. The global pandemic reversed the poverty reduction progress; the

poverty rate, which dropped from 33.8 percent to 17.8 percent over the ten years from 2009 to 2019/2020, surged by 2.8 percentage points since 2020, indicating a fall of around 460,000 people below poverty income thresholds (World Bank, 2022). Although the Royal Government's success in COVID-19 containment was exemplary, much of its population remains vulnerable to shocks and risks of falling below the poverty line. Also, many young Cambodians face poverty and social exclusion due to poor employment prospects because of little or no access to education or skills training and low-quality education. According to the Youth Multi-dimensional Deprivation Indicator (Y-MDI), one young Cambodian out of five is deprived in two or more well-being dimensions at the same time, including health, employment, education, and civic participation, while 40 percent fare poorly in at least one of these dimensions (OECD, 2017a). To ensure job seekers adapt to workplaces and become employable, effective and purposeful interventions require a systematic assessment of the market needs. Although the pandemic has had a detrimental effect on Cambodia's economy by shrinking the tourism, manufacturing exports, real estate, and construction sectors, it has accelerated the shifts towards digitalizing economic activities with the potential to create productive work opportunities in the near future.

Given the limited studies, it is crucial to understand that the initiative has been a lifeline for targeted families, preventing them from falling into food insecurity, debt, or the sale of family assets while ensuring healthcare and children's education. This chapter, therefore, holds immense significance as it aims to contribute significantly to the integrated response of poor urban settings in Phnom Penh in the context of economic recovery and strengthening the Government's social protection measures. The laid-off workers, who lost their jobs during the pandemic and are currently unemployed or employed with a low level of income and workers in the informal sector not having sustainable sources of income, are the worst affected; to enhance the economic conditions of their families, it is essential to understand their priorities in the post-pandemic context. The research provides profound insights into improving the economic situation of families of laid-off and low-skilled workers by exploring opportunities for wage and self-employment. Thus, the study aims to identify the most viable economic sectors for potential employment and demand-driven occupations and skillsets required in the post-pandemic context for productive employment, underlining the urgency and necessity of this research. From policy perspectives, these insights will support purposeful interventions by the Government and private and non-government organizations (NGOs). The study will facilitate policy decisions for the economic welfare of the target group, potentially enhancing the livelihoods of Cambodia's most vulnerable populations.

As the introductory section of the chapter offers a broad perspective on the research topic, setting the stage for the subsequent sections, we present the pertinent literature, providing a comprehensive understanding of the subject matter in the following section. The methodology adopted in the study is presented in the third section, followed by empirical results and discussions. Finally, the concluding section serves as a culmination of the entire study, summarizing the key findings that have emerged from the research, including a deeper understanding of the implications and significance of the findings. This section also includes the directions for future research.

2. LITERATURE REVIEW

2.1 COVID-19 and Social Protection in Cambodia

Recognizing the significant role of social protection toward economic growth with equity and inclusiveness, in July 2017, the Royal Government endorsed the National Social Protection Policy Framework 2016–2025 (SPPF), which aimed to harmonize, integrate, and strengthen the existing social protection schemes to increase the effectiveness, transparency, and consistency of the entire social protection system (Royal Government of Cambodia [RGC], 2017). The social protection framework focuses on two main pillars, social assistance, and social security, and intends to ensure income security and reduce Cambodians' economic and financial vulnerability. Social assistance programs are publicly supported and targeted to the most vulnerable through conditional or non-conditional in-kind or cash transfers (Food and Agriculture Organization of the United Nations [FAO], 2019).

As a social assistance program, the CTP, which came into force during COVID-19 and continued for several months after the end of the pandemic, was based on the successful implementation of a cash transfer program for poor pregnant women and children under two years of age from families with IDPoor Equity Card implemented since 2016. The IDPoor Program, established in 2006, aimed to identify target groups for various poverty reduction interventions. IDPoor cardholders are supported through several means of government assistance to support livelihoods and promote social equity. As a standard tool, Government and Non-Government organizations must use IDPoor to target social services to poor and at-risk households (Ministry of Planning [MOP], 2024). Based on the Royal Government's IDPoor Program poverty thresholds, the identification of Poor Households Program classifies household income level using a proxy means test that assigns a "poverty score" to the household based on a range of information, including demographic data, number of children in the household, and debt. Accordingly, it classifies households as Non-poor, Poor (IDPoor 2), and Very Poor (IDPoor 1) (OECD, 2017b). Apart from IDPoor equity card-holding households, to bring other households under the umbrella of the cash

transfer program, it was felt necessary to identify and register households experiencing changes that made them newly eligible for IDPoor. As such, the already "on-demand" IDPoor (OD-IDPoor) process, which the Ministry of Planning initiated in 2017, required a nationwide implementation. This was completed in all of Cambodia's 1,646 communes in May 2020, which included 191,000 newly poor households that became beneficiaries of the CTP (Pagnathun *et al.,* 2021).

To mitigate the devastating socioeconomic fallout and protect the poor and vulnerable against the adverse effects of the global pandemic, in addition to a base cash transfer per household in rural and urban areas, additional benefits were provisioned based on location, poverty status, household demographic characteristics, and level of vulnerability (Table 3.1). This was meant to ensure the principle of equity and equality of the CTP (RGC, 2020).

Table 3.1: Amounts of Payments under the CTP (COVID-19)

Benefits (per month)	*Areas*					
	Urban Households in Phnom Penh (US$)		*Urban Households Outside Phnom Penh (US$)*		*Rural Households (US$)*	
	IDPoor 1	*IDPoor 2*	*IDPoor 1*	*IDPoor 2*	*IDPoor 1*	*IDPoor 2*
Family with IDPoor	30	30	30	30	20	20
Each family member	13	9	10	7	6	4
Additional top-ups for vulnerable members						
Children, 0–5 years old (per child)	10	7	10	7	6	4
Disability person (per person)	10	7	10	7	6	4
Aged person above 60 years old (per person)	10	7	10	7	6	4
Family member with HIV (per person)	10	7	10	7	6	4

Note: Exchange rate: US$1 = KHR 4,000

Source: *Prakas* released by the Ministry of Social Affairs, Veterans and Youth Rehabilitation (MoSVY) on June 15, 2020.

The first study on the socioeconomic impacts of the COVID-19 cash transfer program on households in Cambodia conducted by the United Nations Development Program (UNDP) in Cambodia and the General Secretariat for the National Social Protection Council (GS-NSPC) was based on three rounds of interviews undertaken between December 2020 and June 2021. The study reveals a reduction of the unemployment rate by 0.57 percent in 2020 and 0.62 percent in 2021, including a reduction of the poverty rate by 2.7 and 3.4 percent in 2020 and 2021, respectively. Based on the Food Insecurity Experience Score (FIES) results, the cash transfer program protects poor and vulnerable households from further food insecurity, ensuring they have enough rice and other food. Further, the recipients of the CTP had more cash to spend on their necessities, and a comparison between the beneficiaries and non-beneficiaries of the program shows that the non-beneficiary households borrowed more from informal money lenders than the beneficiary households (UNDP & GS-NSPC, 2022).

The World Bank (2021) study also revealed that the transfer amounts were adequate to sustain a minimal living standard for most recipient households. While the average CTP-COVID benefit for IDPoor 1 was equivalent to 21 percent of the proposed national poverty line (44 percent of the proposed food poverty line), it was 17 percent of the proposed national poverty line (35 percent of the proposed food poverty line) for IDPoor 2 households. The Royal Government provided additional measures to support the private sector in mitigating the impacts of COVID-19 on businesses and workers in Cambodia. The suspended workers in the garment, textile, and footwear (GTF) sector received government subsidies of US$ 40 per month and an additional US$ 30 per month, which employers contributed. Also, the hotel, guest house, restaurant, and tourism workers received US$ 40 per month, and in addition, enterprises provided financial contributions to their employees voluntarily or subject to their financial capacity (O'Connell, 2021).

2.2 COVID-19 and Social Protection in Other Asian Countries

Experiences from other developing Asian countries also showed a positive contribution of the cash transfer program to the livelihoods of the poor and vulnerable affected by the pandemic. India's COVID-19 social assistance package, namely, *Pradhan Mantri Garib Kalyan Yojana* (PM-GKY), announced in March 2020, provided cash direct benefit transfers (DBT) and in-kind supports (IKS) through existing schemes for immediate relief to the vulnerable population. The country's social protection package of US$ 24 billion at the federal level was almost half of the combined package of all middle-income countries. In addition, State governments announced additional measures. Of the US$ 24 billion package, about US$ 10 billion was for cash transfer, and the remaining was for in-kind support, primarily food grains (Thapliyal & Goli,

n.d.). Under the cash transfer package, INR 500 (US$ 7) was transferred to the bank accounts of 200 million women every month, while 87 million farmers received an advance payment of INR 2,000 (US$ 28) under a preexisting income support program called *Pradhan Mantri Kisan Samman Nidhi* (PM-KISAN). Besides, 30 million poor senior citizens, widows, and persons with disabilities received ex-gratia of INR 1,000 (US$ 14) under a preexisting pension program called the National Social Assistance Program (NSAP), while 80 million poor women got advance payment of about INR 784 (US$ 11) to buy LPG for household cooking for the next three months. Varshney *et al*. (2021) examined the impact of the PM-GKY assistance package on the procurement of agricultural inputs. The result reveals that the transfer package significantly alleviated credit constraints and increased agricultural investments. The farmers who received benefits from the PM-GKY scheme spent substantially more on procuring seeds, fertilizers, and pesticides. At the micro level, in a longitudinal study in one of the states in India, Bihar, from December 2019 to September 2020, Makkar *et al*. (2022) examined food insecurity before and after the lockdown and the cash transfer in moderating negative effects of food insecurity. The swift economic response to the pandemic crises using targeted income transfers successfully mitigated the potentially profound impacts of food insecurity. Households that received cash transfers had lower odds of being food insecure once the lockdown was lifted.

In response to the economic distress and livelihood crisis of the poor due to the COVID-19 pandemic, the fifth most populous country in the world – Pakistan, launched the *Ehsaas Emergency Cash* (EEC) program to deliver one-time emergency cash assistance to the most vulnerable. The EEC program covered 16.9 million families at risk of extreme poverty (Nishtar, 2021). Based on the EEC provision, each low-income household received a one-time payment of PKR12,000 (US$75) to buy food items for four months (Markhof, 2020). A telephonic survey conducted during the program implementation showed that 97 percent of beneficiaries used the total cash amount during the lockdown, and 93 percent of the cash transfer was spent on sustenance alone (Poverty Alleviation and Social Safety Division 2020, as cited in Nishtar, 2021). The survey reveals the necessity of cash transfers to meet the basic needs of the targeted families in the country. Similarly, to protect the most vulnerable people who need assistance during the pandemic, Indonesia built a fiscal stimulus package through expanded social assistance and increased benefit levels. The package includes the regular conditional cash transfer (*Program Keluarga Harapan* [PKH] – Family Hope Program) expanded to the bottom 25 percent of the population distributed monthly; social cash assistance, targeting families in the 30^{th} to 40^{th} percentile of the population living outside Jakarta and metropolitan areas, who received IDR600,000 (US$43) per month not covered under PKH or Program *Sembako*; food assistance program *Sembako*, expanded to the bottom 30 percent of the population who received benefits increased from food worth IDR150,000 to

IDR200,000 (from around US$10 to US$12) per month. The others include food assistance to affected families in Jakarta and the metropolitan areas equal to IDR600,000 (US$43) paid monthly, unconditional cash transfers from the Village Fund (BLT Dana Desa) IDR300,000 (US$21) per month, although initially it was IDR600,000 (US$43) per month, and electricity subsidies to the poorest 40 percent of the population (Aulia & Maliki, 2021).

The Royal Thai Government introduced new interventions and existing programs to expand social protection coverage during the crisis. The "*No One Left Behind*" program, a temporary wage subsidy scheme targeted at informal workers, farmers, fishers, and herders with a three-month wage subsidy of THB 5000 per month, paid from May 2020, reached almost 50 percent of the labor force in the country (Andrade & Borges, 2023). In addition, the State Welfare Card (SWC) program, a cash transfer program targeted at the poor and vulnerable, the Old Age Allowance, the Persons with Disabilities (PwD) Allowance, and the Child Support Grant were expanded. Further, a new cash transfer program targeted at poor and vulnerable, self-employed workers and farmers, the "*We Win*" program was introduced in January 2021 with monthly THB 7000 benefits delivered for two months and later extended for another month which covered 33.2 million people in the country (World Bank Group, 2021). All SWC recipients received monthly THB 1,000 in April – June 2020, THB 500 per month in October – December 2020, January – March 2021, and an additional THB 200 per month per person for six months from July to December 2021 (World Bank Group, 2021). Also, the *'We Love Each Other*' program, announced on February 15, 2021, provided new transfers for formal sector workers. A rapid phone survey conducted among households in April – June 2021 revealed that the recipients of the "*No One Left Behind*" program benefitted, reaching 80 percent of the households (Belghith & Arayavechkit, 2021).

2.3 Potential Sectors for Employment

Cambodia's decades of stable economic growth and efficient macroeconomic management played an important role in creating jobs in promising sectors. Cambodia Job Outlook 2018 projected the most robust job growth in textile, apparel, and footwear; hotels and restaurants; trade; construction; finance; transportation and communications; and real estate and business (National Employment Agency [NEA], 2018). Further, the Job Outlook shows the expected opportunity to work in computer, Information Technology, and multimedia. However, the global pandemic has had an unprecedented impact on the Cambodian labor market, resulting from the closure of business units, including several other restrictive measures directed to control the spread of the virus. According to the ADB (2020), the sectors most affected by projected employment losses were construction, manufacturing, hotels and restaurants, transport, storage, and communications.

Retail Sector

A sharp rise in Cambodians' disposable income, including the presence of a large expatriate workforce and a strong tourism industry, contributed to the growth of modern retail outlets, including shopping malls, mini-marts, convenience stores, and supermarkets in Phnom Penh city. Cambodia's retail sector has undergone a significant transformation within the past few years. Cambodians slowly and steadily shift from traditional to modern markets due to better hygiene, quality, and variety (Food Export Association of the Midwest USA and Food Export USA-Northeast, 2022).

According to the UK-based Institute of Grocery Distribution, the grocery market industry in Cambodia was predicted to reach US$9.3 billion by 2023 (Food Export Association of the Midwest USA and Food Export USA-Northeast, 2022). By 2026, the retail sales in the packaged food market in Cambodia are expected to reach nearly US$1.1 billion, a growth rate of 21.6 percent from 2022 (Food Export Association of the Midwest USA and Food Export USA-Northeast, 2022).

Information, Communication, and Technology (ICT) Sector

Cambodia's ICT sector is seen as having exponential growth, including demand for the Internet, mobile phones, and other forms of technologies continue to rise. Based on the World Bank, International Telecommunication Union (ITU), and Global System for Mobile Communications (GSMA) statistics, by 2020, mobile connections in Cambodia reached 21.18 million, and mobile penetration was more than 126 percent. The Internet users were 8.86 million, and the penetration reached 52.6 percent by January 2021, which increased by 1.1 million (+14 percent) within one year. In addition to traditional voice and data services, additional digital services, including online office, remote video conference, remote education, and e-commerce, are more heavily dependent on the digital infra requirements of universal broadband and speedup broadband network (Khmer Times, September 21, 2021).

The rapid assessment of emerging needs for workers and skills in times of COVID-19 crisis (NEA, 2020) indicated that 38.9 percent of total establishments interviewed reported having introduced new ICT practices in the workplace in the last three years. There was an increase in the use of ICT in the ICT sector, and the survey showed that over three-quarters of the establishments within the sector made new use of ICT available in the workplace. Concerning future business opportunities, the ICT sector suggested the highest rate of business opportunities, with 32.7 percent of establishments interviewed in the sector. The top six occupations by sector that have experienced an increase in the use of or requirement for ICT skills were accommodation, construction, food and beverages, garment, footwear, apparel, ICT, logistics, warehousing, transportation, rubber, and plastics.

Manufacturing Sector

One of the most remarkable developments from the economic reforms of the Royal Government was the growth of the country's manufacturing sector. Cambodia's manufacturing sector accounted for 31.3 percent of the country's economy in 2016, and the growth rate for value added in the industry was the highest (9.7 percent) in 2017 in Southeast Asia (ADB, 2018). At the end of 2018, there were 1,528 factories in Cambodia, with 922, nearly two-thirds of which were operated by weaving, bag, garment, and footwear manufacturers. The total income from the production of domestic and export products by these industries was about US$ 13.17 billion in 2018, an increase of 23 percent compared to 2017 (Ministry of Information, 2019). By 2020, the number of garments, footwear and travel goods factories reached 1,218, engaging more than 808,223 workers/employees and indirectly benefitting about 2.5 to 3 million people (RGC, 2022). Thus, the garment sector continues to be one of the critical engines of growth, providing jobs and livelihood to millions in the country.

Construction Sector

Construction is one of the four pillars supporting the Cambodian economy and generating employment opportunities in addition to the garment industry, tourism, and agriculture. Cambodia's construction sector attracted a total investment of US$ 9.35 billion in 2019, up 79 percent from US$ 5.22 billion in 2018. As per the Ministry of Land Management, Urban Planning, and Construction, against 2,867 projects in 2018, the ministry granted licenses to 4,446 construction projects in 2019, leading to an increase of 55 percent in projects. As per the ministry report 2019, around 1,081 construction and home design companies operated in the country and generated approximately 150,000 jobs (Xinhua, December 25, 2019). Further, Cambodia's investment in the construction sector also registered a remarkable rise in the first half of 2020 as against 2019. Despite the global crisis due to COVID-19, Cambodia's construction investment value in the first half of 2020 has reached US$ 3.8 billion, indicating a 12 percent increase compared to the same period in 2019 (Cambodia Constructors Association, 2020).

Tourism and Hospitality Sector

Over the last decade (except for COVID-19), there has been a continuous increase in the number of tourists visiting Cambodia. In 2019, the total number of international tourists visited was 6,610,592, whereas it was 6,201,077 in 2018. This resulted in a 6.6 percent growth of international tourists in 2019 compared to the previous year (Ministry of Tourism [MOT], 2020). In 2019, the contribution of travel and tourism to employment for Cambodia was 3,046.8 thousand persons, as against 2,911.6 thousand persons in 2018, which increased by 4.6 percent. Considering the

last two decades, the contribution of travel and tourism to employment in Cambodia increased from 905 thousand persons in 2001 to 3,046.8 thousand persons in 2020. Further, the contribution of travel and tourism as a percentage of Cambodia's Gross Domestic Product (GDP) in 2019 was 32.5 percent compared to 31.6 percent in 2018 and 15.1 percent in 2021 (Knomea, n.d.). However, due to COVID-19, the sector has drastically fallen with international travel restrictions and the closure of many international flights worldwide.

Finance/Banking/Insurance Sector

The steady growth of the Cambodian banking sector over the past two decades has been backed by a liberal investment regime and market trade policies. Although Cambodia's insurance sector is nascent, the rising acceptance of insurance policies by Cambodians as protection for the future is leading to an overwhelming influx of insurance firms into the country, creating numerous job opportunities for young people. Currently, the total assets of banking and financial institutions have increased by 17.4 percent, credit has increased by 19.6 percent, and deposits have increased by 12.3 percent. Further, the banking and finance sector continues to promote financial inclusion, with the number of deposit clients reaching 8.2 million accounts – an increase of 20 percent and credit clients rose by 3.2 million accounts, up 13 percent (Khmer Times, July 9, 2020). Thus, more employment opportunities are likely to be created due to the fast growth of the country's finance/ banking sector.

While studies in other countries have explored the potential for offering decent and stable employment in the post-COVID-19 recovery phase, including the specific skill set the target group requires, such studies in Cambodia are scarce. The few studies conducted in Cambodia are case-based and require a more comprehensive approach. Therefore, this study significantly contributes to the existing literature by examining the most viable economic sectors for potential employment, including demand-driven occupations and employees' required skills, and investigating the existing skills. Moreover, it delves into the potential barriers for the target group to acquire the skills needed for secure employment and the enabling factors that motivate the target group to acquire the essential skills for decent and stable jobs in the post-COVID-19 context, providing practical insights into employment strategies in Cambodia.

3. METHODOLOGY

3.1 Study Area

The study is a collaborative effort, purposively selecting two of the Phnom Penh's urban area (Khans) for primary data collection. The selected communities are fallen under two Khans namely Khan Pou Senchey, and Khan Mean Chey.

3.2 Study Participants

The primary respondents of the research are the laid-off workers who lost their jobs during the COVID-19 global pandemic. As a qualitative study, from four target locations, we selected 120 households (30 households from each target location) and conducted in-depth interviews based on purposive sampling. As a non-random sampling, we used purposive sampling to select laid-off workers to meet our research objectives. Purposive sampling works well with limited samples and when the study selects particularly informative participants (Saunders *et al.*, 2009).

In addition, we conducted one focus group discussion (FGD) in each target area, comprising six participants. As such, four FGDs were performed in total with the participation of 24 laid-off workers to understand the economic challenges and perspectives of target groups in terms of the most viable economic sectors for potential wage and self-employment, including market-driven skills in the post-pandemic context.

Also, to comprehensively understand the current and future labor market, the study conducted key informant interviews (KIIs) with 12 private enterprise employers covering real estate and construction, food and beverage, tourism and hospitality, wholesale and retail trade, and automotive industries. The findings from these interviews, the survey data, and the FGDs provide a detailed understanding of the factors motivating skill acquisition in the labor market.

3.3 Data Collection and Analysis

The study used a pre-tested structured questionnaire during the survey to collect primary data from the target respondents. Also, we sought qualitative information from the respondents through open-ended questions in the FGDs to mark their understanding of the complex situation of the post-pandemic and thoughts on paths to overcome the crisis. In addition to the survey and FGDs, we gathered the required secondary data from different publications of the Asian Development Bank (ADB), United Nations Development Program, World Bank, Ministry of Economy and Finance (MEF), Ministry of Labor and Vocational Training (MLVT), and others. This comprehensive approach to data collection ensures that we have a complete and accurate understanding of the economic situation of laid-off workers during and after COVID-19.

Data gathered from the respondents and their opinions are analyzed through a comprehensive blend of quantitative and qualitative methods, ensuring a well-rounded understanding of the study's objectives. Open-ended responses were coded to arrive at clusters, and percentage responses were tabulated. The study used descriptive statistics, and data were analyzed primarily through frequency tables and cross-tabulations to filter the required information. The study also used a thematic approach to examine the responses gathered from target participants, adding a layer

of depth to the analysis. Data analysis was taken separately for target categories and sub-populations (sex) before it was undertaken for the overall group of the study, demonstrating a comprehensive and well-rounded approach to the study's findings.

4. EMPIRICAL RESULTS AND DISCUSSIONS

4.1 Socio-Demographic Profile of the Study Participants

Below is the socio-demographic profile of the sample laid-off workers in terms of their sex, age, marital status, education, skills, and income levels.

Gender Representation of Sample Respondents

Our study reveals a significant trend in the gender representation of the sample workers. We observe a higher number of female (57.5 percent) than male respondents (42.5 percent), a finding that underscores the growing role of women in the labor market. The percentage representation of female respondents in the target areas ranged from around 50.0 percent to 60.0 percent, with the highest representation in Khan Pou Senchey at 61.7 percent (Table 3.2).

Age Distribution of Sample Respondents

The study focuses on the age distribution of the sample workers, with a particular emphasis on the 31–43 age group, which constitutes the majority of the respondents at 52.5 percent. The lowest percentage is part of the oldest age group of 44 and above (9.2 percent). In all age groups, the percentages of the sample female respondents were higher than the male counterparts (Table 3.2).

Marital Status of Sample Respondents

When considering the marital status of the sample respondents, it is notable that a significant portion were married (68.3 percent), indicating a stable and committed labor force. This is followed by about a quarter single (24.2 percent). The other surveyed workers were divorced (5.0 percent), and a few study participants were widowed (2.5 percent). Over half were female workers in both single and married categories (Table 3.2).

Educational Level of Sample Respondents

A significant percentage of our respondents, 40.8 percent, had attained primary education. The next highest percentages were 26.7 percent and 15.8 percent, for secondary and high school education, respectively. The representation of workers from technical and vocational education was 9.2 percent, and the lowest, 7.5 percent,

had not completed the primary level. Furthermore, 63.3 percent of the surveyed respondents were unskilled. In the unskilled category, 65.8 percent were female, and 34.2 percent were male workers. In contrast, in the skilled category, a higher percentage, 56.8 percent, were male and 43.2 percent were female workers (Table 3.2).

Income Level of Sample Respondents

More than one-tenth of the surveyed respondents (11.7 percent) had no income, and 37.5 percent of them earned less than US$ 100 per month. Also, the highest, 44.2 percent had a monthly income between US$ 101 to US$ 200. A small percentage of respondents (6.7 percent) had earned more than US$ 200 per month. Among respondents of 'no income' category, the female representation was 78.6 percent (Table 3.2).

Table 3.2: Survey Respondents' Demographic Profile

Profile	*N*	*Percentage*	*Female*	*Male*
Sex	120	100%	69 57.5%	51 42.5%
Survey Areas				
Khan Pou Senchey	60	50%	37 61.7%	23 38.3%
Khan Mean Chey	60	50%	32 53.3%	28 46.7%
Age Group				
18–30	46	38.3%	29 63.0%	17 37.0%
31–43	63	52.5%	34 54.0%	29 46.0%
44 and above	11	9.2%	06 54.5%	05 45.5%
Marital Status				
Single	29	24.2%	17 58.6%	12 41.4%
Married	82	68.3%	49 59.8%	33 40.2%
Divorced	06	5.0%	– –	06 100.0%

Profile	*N*	*Percentage*	*Female*	*Male*
Widowed	03	2.5%	03 100.0%	– –
Educational Levels				
Incomplete Primary	09	7.5%	06 66.7%	03 33.3%
Primary level	49	40.8%	33 67.3%	16 32.7%
Secondary level	32	26.7%	18 56.3%	14 43.7%
High School level	19	15.8%	08 42.1%	11 57.9%
Technical & Vocational	11	9.2%	04 36.4%	07 63.6%
Skills Levels				
Skilled	44	36.7%	19 43.2%	25 56.8%
Unskilled	76	63.3%	50 65.8%	26 34.2%
Monthly Income Levels				
No Income	14	11.7%	11 78.6%	03 21.4%
Less than US$ 100	45	37.5%	31 68.9%	14 31.1%
US$ 101 – US$ 200	53	44.2%	25 47.2%	28 52.8%
More than US$ 200	08	6.7%	02 25.0%	06 75.0%

Source: Field survey

In addition to the field survey, four FGDs were conducted which include participants stratified by sex, age and specific sub-populations: participants without work, persons with disability, informal economy workers, and participants with no/low skills and no/low education. Verbal consent was sought from all the FGD participants before the group discussion was conducted.

4.2 Level of Understanding of Social Protection Coverage and Satisfaction with Access to Services

Study respondents reported having access to social protection services during the pandemic and post-pandemic period. The majority of them (89.2 percent) were the beneficiaries who accessed special assistance during and after the COVID-19 pandemic (COVID-19 cash transfer for IDPoor/COVID-19 lockdown food package) and National Social Security Fund's contributory member (85.8 percent) for informal economy workers. The level of understanding of respondents of social protection in Cambodia was assessed with a scale of 1–10, where 1 is "no understanding," and 10 is "significant level of understanding." The self-assessed mean value of overall understanding of the social protection landscape was 6.2 (male: 6.5; female: 6.1), indicating moderate to significant levels of understanding among the respondents.

The study also found that respondents were largely satisfied with the social protection services they received. The mean satisfaction score of 4.1 indicates a positive perception of the information provided about social protection schemes, the administrative process for enrolling, and the quality of benefits received (Table 3.3). This high level of satisfaction instills confidence in the system's performance. Respondents felt that the services they received were timely and need-based, further reinforcing their positive experience.

Table 3.3: Respondents' Satisfaction Levels with Different Aspects of Social Protection

Aspects of Social Protection	*Satisfaction Levels of Respondents (f)*				
	Very Dissatisfied	*Dissatisfied*	*Neutral*	*Satisfied*	*Very Satisfied*
	1	*2*	*3*	*4*	*5*
Receiving information about social protection schemes	–	2	7	67	44
Administrative process for enrolling to avail social protection benefits	–	5	13	64	38
Quality of social protection benefits received	–	6	15	63	36
Overall Mean: 4.1					

Source: Field survey

4.3 Labor Market: Supply-Side Analysis

Perceived Potential Sectors for Employment

In the post-COVID-19 recovery phase, the sample respondents identified a diverse range of potential sectors that could offer them employment in Phnom Penh. The wholesale and retail trade sector, perceived by 69.2 percent of our target respondents, leads the way, followed by the food and beverage sector (53.3 percent), tourism and hospitality (39.2 percent), real estate and construction (35.8 percent), and others (Figure 3.1). Also, the diversity of potential employment sectors, as reported in our FGDs, includes the opportunity to work for new construction of high-rise buildings, the growth of automotive mechanics, and the opening of new business units, particularly restaurants and retail stores, food and beverages, and others that create employment opportunities.

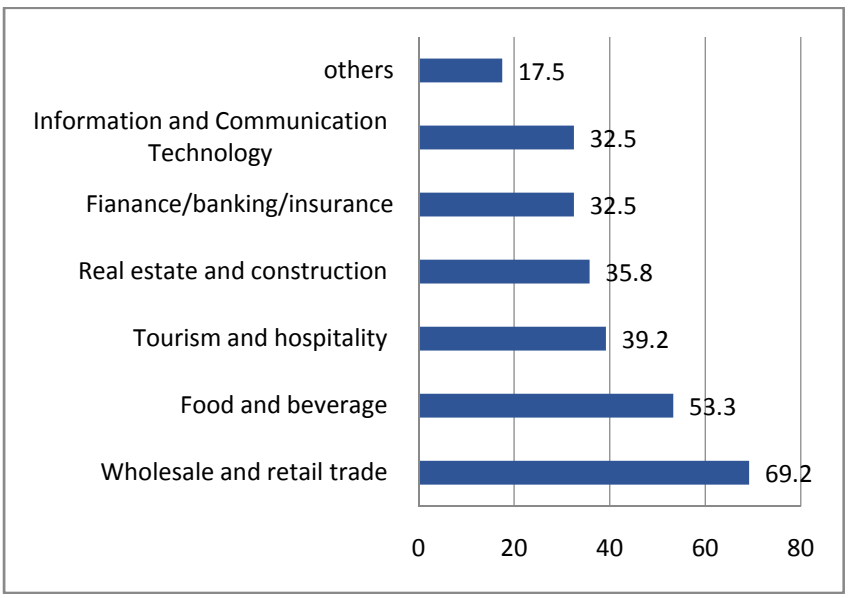

Figure 3.1: Perceived Potential Sectors for Employment

Based on their education, skills, and experience, respondents demonstrated a diverse range of sector preferences. The top three sectors were food and beverage (63.3 percent), wholesale and retail trade (52.5 percent), and real estate and construction (32.5 percent). The primary data also revealed intriguing differences in the preferences of female and male respondents. For the female respondents, food and beverage was the clear favorite (76.8 percent), followed by wholesale and retail trade (73.9 percent). In contrast, the male respondents' top choice was real estate and construction (56.9 percent), followed by food and beverage (45.1 percent) and automotive mechanics

(37.3 percent). This diversity in sector preferences among the respondents is one of the key findings of this study (Figure 3.2).

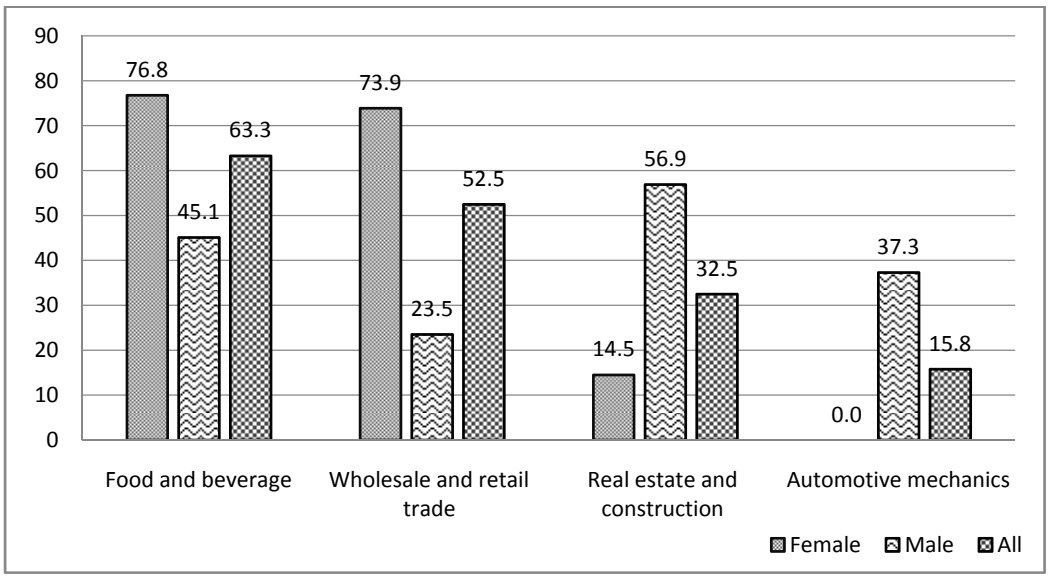

Figure 3.2: Gender Diversity in Sector Preferences for Work

Perceived Technical Skills for Employment in Preferred Sectors

The study participants identified the required technical skills to secure a job in their preferred sectors (Table 3.4). Notably, Phnom Penh has seen a significant surge in the food and beverage sector, with promising growth in the e-commerce platforms. This growth, further fueled by the COVID-19 and post-COVID-19 pandemic, has created a demand for workers with digital skills to enter the food and beverage industry. Among a number of skills, the common skills required are food and beverage management, product knowledge, quality checking, customer service, inventory management, and social media management, including mobile integration. Most technical skills required for the second most employment potential sector – wholesale and retail trade, were business skills, wholesale and retail sales, product knowledge, quality checking, stock management, and business relationships. Likewise, according to the respondents, the most demanded technical skills for real estate and construction were the use of tools and machines, construction knowledge and skills in structural design, building and engineering, and others. The growth of construction and other related sectors, including transportation, raise the demand for automotive mechanics who need to possess a number of critical skills. These include engine management, using scanners to check failures, power train systems, automotive electronic control chassis and body, automotive hybrid systems, and others.

Table 3.4: Perceived Technical Skills Required for Employment in Preferred Sectors

Preferred sectors	*Perceived technical knowledge and skills required*
Food and beverage	Food and beverage management, product knowledge, quality checking, customer service, inventory management, social media management
Wholesale and retail trade	Business skills, wholesale and retail sales, product knowledge, quality checking, stock management, business relationships
Real estate and construction	Use of tools and machines, construction knowledge and skills
Automotive mechanics	Engine management, using scanner to check failures, powertrain system, automotive electronic

Source: Field survey

Level of Knowledge and Technical Skills of Respondents

Most respondents interested in working in their preferred sectors possessed little or some technical knowledge and skills, including a few; the preferred sector was new. More than half of the respondents (n = 39; 51.3 percent) possessed slight technical knowledge and skills in the food and beverage sector. However, more than two-fifths of respondents (n = 29; 46.0 percent) in the wholesale and retail trade were somewhat knowledgeable as previously some of them were engaged in the retail trade, a sector with significant employment potential. In the real estate and construction sector, only 7.7 percent of respondents (n = 3) were knowledgeable, and most (43.6 percent) were slightly knowledgeable. Also, most automotive mechanics (n = 10; 52.6 percent) had slight technical knowledge and skills. Finally, none of the respondents possessed

Table 3.5: Perceived Technical Knowledge and Skills Possessed by the Respondents

Preferred Sectors	*Perceived technical knowledge and skills possessed (f)*					*Modal Value*
	1	*2*	*3*	*4*	*5*	
Food and beverage (n = 76)	18	39	12	7	–	2
Wholesale and retail trade (n = 63)	11	18	29	5	–	3
Real estate and construction (n = 39)	10	17	9	3	–	2
Automotive mechanics (n = 19)	7	10	2	–	–	2
All preferred sectors	46	84	52	15	–	2

Note: Scale 1 to 5: 1- Not at all knowledgeable, 2- Slightly knowledgeable, 3- Somewhat knowledgeable, 4- knowledgeable, 5- Very knowledgeable

Source: Field survey

high expertise in their preferred work sectors. The overall modal value of 2 clearly shows that most respondents were slightly knowledgeable or had a shallow level of technical knowledge and skills in their preferred sectors of work (Table 3.5). The findings strongly underscore the urgent need to build the capacity of potential beneficiaries in these crucial sectors, which requires technical knowledge and skills for possible employment.

Perceived Levels of Skills Gap

When we consider the skills demanded by the labor market and the skills possessed by our survey respondents, a significant finding emerges. Seven out of ten respondents (n = 82; 68.3 percent) perceive a substantial skills gap. Notably, there are gender differences in this perception. 69.6 percent of female respondents (n = 48) and 66.7 percent of male respondents (n = 34) believe that the skills gap is substantial. This underscores the need for gender-specific interventions, which have the potential to bridge this gap, as the majority of both female and male respondents acknowledge possessing skills that are significantly lower than those demanded by the labor market.

Having perceived that possessing skills was below the labor market demanded skills, survey respondents self-assessed how their skill shortage affects the opportunities to secure a job in the market. The results are alarming. Although, one-fifth (20.8 percent) of respondents considered it would affect them slightly, around one-quarter of them (25.8 percent) felt moderately, and more than half of them (n = 64; 53.3 percent) firmly realized that it would affect the opportunity to secure a job seriously or extremely (Figure 3.3).

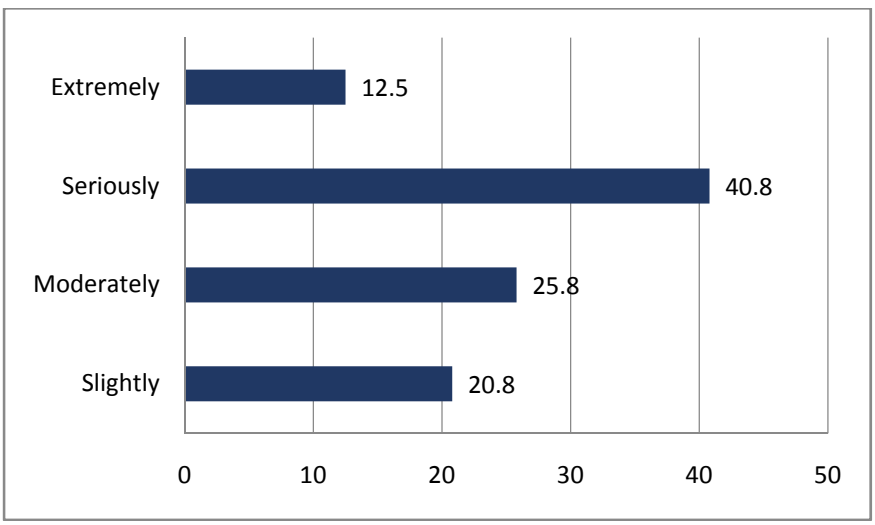

Figure 3.3: Extent of Skills Shortage on Employment (%)

In the post-COVID-19 context, the FGD participants perceived the need to diversify and reinforce their professional skills. They admitted that potential employers would like to see several soft skills among them besides technical knowledge and hard skills. These soft skills include:

- Communication skills, particularly Chinese and English language skills, are key to success in the hospitality industries, especially in food and beverage and retail trade.
- Problem-solving skills are mostly cited as a requirement for the real estate, construction, and automotive sectors.
- Interpersonal skills and teamwork are universally required for all jobs, underscoring their broad applicability in the labor market.

In the present labor market context, participants felt the necessity of upskilling to optimize their performance and reskilling to grab other opportunities as they became available.

Possible Barriers to Acquiring Technical Knowledge and Skills

The survey respondents identified several potential barriers to acquiring technical knowledge and skills training, which is crucial for securing a stable job. Family financial issues emerged as the most prevalent obstacle, with nearly eight out of 10 respondents (76.7 percent) highlighting its impact. Other significant barriers included

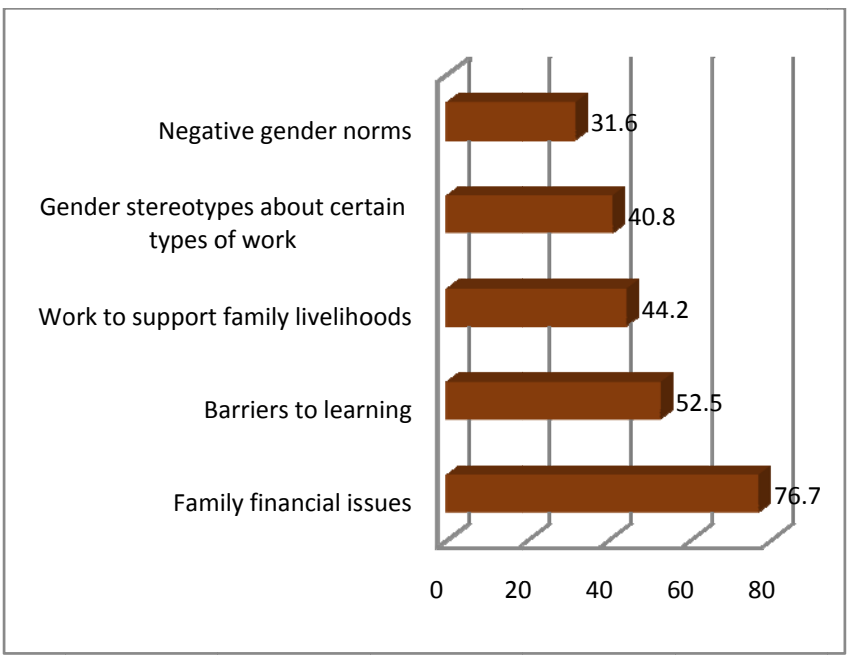

Figure 3.4: Perceived Barriers to Acquiring Technical Skills (%)

participants' learning ability (52.5 percent), the need to work to support family livelihoods (44.2 percent), gender stereotypes about specific types of work (40.8 percent), and the negative gender norms that hinder girls' education, as perceived by nearly one-third of respondents (31.6 percent). These findings underscore the need for immediate and concerted action to address these barriers (Figure 3.4).

Enabling Factors to Acquire Technical Knowledge and Skills

The survey respondents reported several enabling factors that could motivate them to acquire technical knowledge and skills in the post-COVID-19 context. As most respondents admitted, the significant enabling factor was the financial support to the family (93.3 percent). More than half of the respondents (53.3 percent) considered the work opportunities or the possibility of earning soon after acquiring the skills as the second most enabling factor (Figure 3.5). The other factors raised by the respondents were encouragement from families (46.7 percent), supportive attitudes of trainers and peer learners (34.2 percent), and provisions of hands-on practice (32.5 percent).

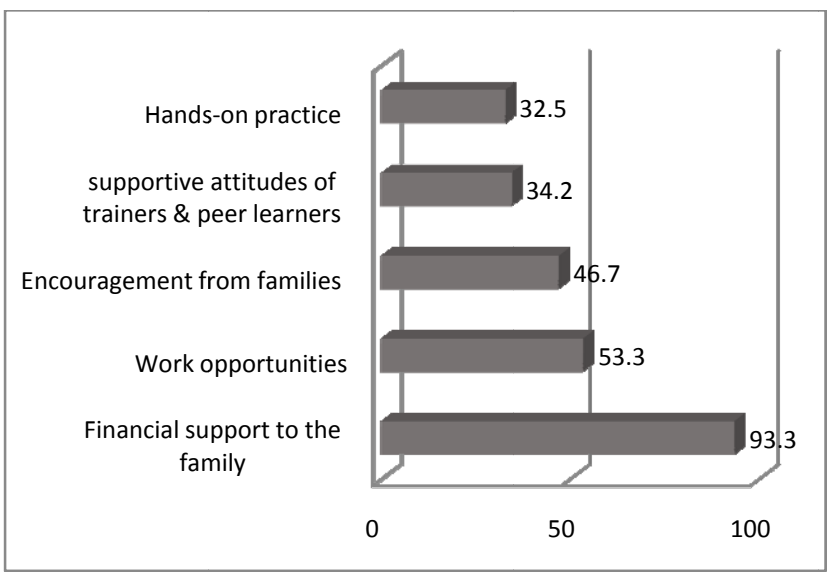

Figure 3.5: Perceived Enabling Factors to Acquire Technical Skills (%)

4.4 Labor Market: Demand-Side Analysis

Perceived Potential Sectors for Employment

In the post-COVID-19 recovery phase, sample enterprises have identified a wide range of sectors that could offer potential employment in Phnom Penh. The top

three industries they perceive as having the most potential include real estate and construction (66.7 percent), food and beverage (58.3 percent), and wholesale and retail trade (58.3 percent). Additionally, tourism and hospitality (50.0 percent), finance and banking (41.7 percent), online retail trade (41.7 percent), and others (33.3 percent) have also been cited as potential job providers in the post-pandemic context. This diversity of sectors provides a broad range of opportunities for job seekers.

Job-Specific Skills and Soft Skills

Most enterprises acknowledge that job seekers must possess not only adequate knowledge and technical skills in their domain area, but also a range of soft skills. For instance, in the field of automotive mechanics, enterprises require skills such as gasoline and diesel engines, injection control systems of both electronic gasoline and electronic diesel engines, using scanners to check for failure in automobiles, battery charging systems, ignition systems, starter and preheating system, automatic gearbox, brake system, suspension system, steering system, and others. Similarly, enterprises installing solar panels on rooftops or other places require their workers to understand solar panel technology and their ability to safely install and maintain the panels. Some of the skills needed by them include photovoltaic (PV) systems (panels and other equipment that make up a solar power system), using power tools (to cut, shape, and connect solar panels), solar energy systems (for proper installation of panels, fixing batteries into a system/connecting inverter to panels, and others). In addition to these technical skills, knowledge and skills about roofing and safety standards are highly required. However, it is not just about hard skills. Job seekers must also possess soft skills. Communication skills are crucial for explaining complex technical issues to non-technical team members, problem-solving skills are essential for troubleshooting and finding solutions to unexpected problems, interpersonal skills are critical for building relationships with colleagues and clients, and teamwork is necessary for collaborating on complex projects. According to the enterprises, these soft skills are increasingly recognized as essential for success in the workplace.

In addition, enterprises cited that the experience required for a particular job depends on its position and level. According to them, various positions require different levels of experience, which become increasingly necessary for higher-skilled jobs. For instance, at the entry-level, most jobs do not need experience as new entrants can learn from their senior peers, including attending the enterprise's in-house training and development programs. Enterprises also expressed that what matters more than the experience level is a good work attitude and communication skills.

Employment-Related Challenges Faced by Enterprises and Measures to Tackle Them

The interviewed enterprises were currently confronted with employment-related challenges involving hard and soft skills. Soft skills are critical, including workers' attitudes, honesty, work ethic, and behavior. These skills are not just desirable, but essential for a productive workforce. Enterprises suggested various measures to tackle these challenges (Table 3.6).

Table 3.6: Employment-Related Challenges and Suggested Measures

Area of Challenges	*Challenges Details*	*Measures*
Hard skills	Limited/poor job-specific knowledge, no exposure to practical situations, lack of/limited experience	Building capacity, allowing learning from seniors and peers, enabling to work in a team, monitoring job performance, providing continuous feedback
Soft skills	Ineffective communication, poor work attitudes-lazy and misuse of working hours through Facebook; lack of creativity	Building soft skills, conducting meetings and open discussions, encouraging to meet job expectations, monitoring working hours
Honesty and work ethic	Unethical-sharing confidential information to third parties, remaining absent from work without permission, lack of commitment to meeting enterprise expectations	Sharing information about unethical practices and the consequence of lapses, tightening rules and regulations in the enterprises, providing opportunities for open discussions with supervisors
Turnover	Leaving the job with immediate notice and after being groomed	Stating employment-related requirements clearly before the appointment, informing legal consequences in the event of a breach of contract

Source: Key informant interviews

5. CONCLUSION

Despite the devastating impact of COVID-19 on the livelihoods of millions, particularly the poor and vulnerable, the Royal Government of Cambodia's CTP played a crucial role in effectively distributing cash during and after the pandemic. This initiative was a lifeline for rural and urban households, providing a much-needed

safety net. The adaptability and resilience of the Cambodian workforce were evident as they strove to become employable, even in the face of job losses and limited employment opportunities due to a lack of education and market-demanded skills. This resilience is a source of inspiration and hope in the context of the labor market's supply and demand dynamics.

The supply side of the labor market reveals laid-off workers' perceived potential employment sectors, including wholesale and retail trade, food and beverage, tourism and hospitality, real estate and construction, and others. Their preferences were based on their educational level, technical skills, and experience. The study respondents' preferred sectors to work include food and beverage, wholesale and retail trade, real estate and construction, and automotive mechanics. Most respondents had little technical knowledge and skills in their preferred work sectors, underscoring the need to build their capacity for potential employment. Among the possible barriers to acquiring technical knowledge and skills, family financial issues topped the list, followed by the learning ability of the respondents.

The demand side of the labor market shows enterprises' three most perceived sectors that offer potential employment in the post-pandemic context, including real estate and construction, food and beverage, and wholesale and retail trade. Most enterprises firmly acknowledge that job seekers must possess adequate knowledge, technical skills, and a range of soft skills to meet their requirements and expectations. Further, a certain level of experience, including a good work attitude and communication skills, is required in the workplace.

In the post-COVID-19 context, workers must adapt to the changing labor market requirements. Laid-off workers must diversify and reinforce their professional skills, including soft skills. These soft skills, often overlooked, are crucial for success in the workplace. Based on labor market demand, workers need upskilling to optimize their performance and reskilling to grab employment opportunities. A holistic approach to skills development, including soft skills, is essential for a successful labor market recovery, ensuring that workers are well-informed and prepared for the challenges ahead.

This study is not free from limitations. First, the study focused on laid-off workers in purposively selected Phnom Penh's urban areas for primary data collection. Therefore, the study findings may not be generalizable to other locations. However, it is assumed that similar results will be expected in other urban areas with comparable socio-economic environments. Future studies in this direction should extend it to different urban communities. Despite limitations, as a micro-level study, in the post-pandemic context, the empirical findings of this study have implications for the government and non-governmental organizations, including the private sector for appropriate interventions. Although the social protection schemes benefit the poor

and vulnerable sections of society and protect them from falling back into poverty, mitigating the impacts of the pandemic on laid-off workers demands evidence-based research, which the study has attempted to do.

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CHAPTER 4

Cambodia's Post-COVID-19 Economic Recovery Through Structural Transformation

Blaise Kilian

1. INTRODUCTION

In 2020, the COVID-19 pandemic suddenly halted two decades of booming economic growth in Cambodia. While the crisis was an extraordinary conjunctural shock, it illuminated the structural limitations of a growth model that enabled Cambodia to lift millions of people out of poverty. Therefore, implementing the policy agenda to address these weaknesses became even more pressing.

This chapter puts into perspective some of the triggering factors for success and failures Cambodia encountered towards the lower-middle income status it achieved in 2015 and some of those it will experience while moving towards the upper-middle income status it aims to reach by 2030. Between these two milestones, COVID-19 can be seen as a magnifier of existing weaknesses and a catalyst for remedial policies.

This chapter, far from being academic, is mainly the result of the author's keen observations based on his experience as a public-private dialogue facilitator and his privileged position in observing Cambodia for more than two decades. Most private sector feedback shared here comes from in-depth discussions with entrepreneurs and foreign investors. Information and comments shared on policy matters come from available literature and interactions with senior representatives of various government institutions. Finally, facts and figures are supported by data published by Cambodia's multilateral partners and national institutions. Overall, this chapter attempts to summarize some of the mechanisms that underlie the many changes Cambodia has been experiencing, provide some understanding of its past and current structural transformation, and discuss the way ahead.

The first part describes the economic model that allowed Cambodia to experience steady socio-economic development for two decades. This development was possible due to policy choices and competitive advantages. The second part studies the limitations of this model built on a narrow base economy, a limited number of partners, and deep structural vulnerabilities. The third part illustrates how the COVID-19-induced crisis highlighted some weaknesses. The fourth part discusses the policy response to address these structural weaknesses. It provides the author's understanding of the necessary dynamics that would allow Cambodia to reach the next

level of its structural transformation in the context of a post-COVID recovery plan. The conclusion raises some of the challenges that need to be overcome if Cambodia is to succeed in its endeavor and resume fast growth towards the upper-middle income status it aims to reach in 2030.

2. CAMBODIA'S CURRENT ECONOMIC MODEL: STEADY GROWTH AND COMPETITIVE ADVANTAGES

2.1 Two Decades of Economic and Social Development

Following signing the Paris Peace Agreements in 1991 and organizing the general election in 1993, Cambodia engaged in accelerated liberalization and privatization of its socialist economy. While the 1989 Constitution transforming the People's Republic of Kampuchea (1979–1989) into the State of Cambodia had already recognized the free market and private property, the so-called Second Kingdom (since 1993) initiated the economy's structural transformation with the support of donors and the international community.

The first years of the Second Kingdom were uneasy, marked by factional fighting that ended in 1998 with a painful political stabilization and the ultimate disintegration of the Khmer Rouge. However, in 1998, conditions were finally in place to foster the model of development that prevailed for the following two decades.

Between 1998 and 2019, Cambodia's economic growth averaged 7.7 percent per year (World Bank, 2022a), placing the country among the fastest-growing economies in the world. Even more significantly, based on World Bank statistics, the Gross Domestic Product (GDP) per capita multiplied by six from USD 270 in 1998 to USD 1,640 in 2019.[1] Foreign direct investment (FDI) significantly contributed to this performance. In 2019, Cambodia was ranked the 15th country in the world with the highest rate of FDI as a percentage of GDP, at 13.5 percent (World Bank, 2019a).

Similar progress was also visible in the evolution of several social indicators. Life expectancy increased by 14 years during the abovementioned period to reach 70 – compared with less than 25 years during the war, just before the Khmer Rouge took over (World Bank, 2022b). About 80 percent of the population is now considered to be literate (UNESCO, 2015), a jump of 13 percent, while the rate of Internet use among the population in 2021 reached 60 percent against one percent in 2008 (World Bank, 2021a). These are just selected illustrations of Cambodia's tremendous social and economic progress since its ultimate stabilization at the end of the previous millennium. Other aspects of Cambodia's socio-economic transformations could be highlighted, including, for instance, changes in consumer behavior that reflect improved livelihoods.

Of course, the country still faces many challenges, such as the ever-growing gap between the rich and the poor, increased pollution, especially with the widespread use of plastic (UNDP, 2019), and deforestation. But overall, Cambodia has performed outstandingly well by most indicators. This track record is even more impressive if one looks back at where the country comes from - a shattered society that less than five decades ago was coerced into mass urban exodus, full-scale collectivization, starvation, the annihilation of human resources, and complete demonetization of its economy.

2.2 Achievement Through a Combination of Competitive Advantages

Cambodia's outstanding—yet under-publicized—performance has been achieved thanks to a combination of competitive advantages that can be grouped into three layers: political stability and sound macroeconomic management; a young, affordable workforce and a business-friendly environment; and the ability to access international markets for both goods and services.

Political stability and sound macroeconomic management were prerequisites for laying the foundations for two decades of economic growth and investment. Although it is also put forward as a slogan, "peace and stability" has provided the necessary context for the political leadership to design and adopt an enabling regulatory framework within which investors could place enough trust to establish, run, and grow their businesses. Cambodia's history is a testimony to the limitations of an unstable political landscape on economic development. Stability also means predictability, and predictability is paramount in a rapidly emerging economy to build the trust of the private sector.

With political stability, the country could tame its inflation and exchange rate at levels that have remained the same until today. This was a remarkable achievement as the previous decade had been marked by high inflation, first as a result of a monetized deficit following the collapse of Soviet financial support at the end of the Cold War, with the inflation rate averaging 90 percent between 1989 and 1992 (Slocomb, 2010). Then, because of a massive inflow of US dollars during the 1992-1993 mandate of the United Nations Transitional Authority in Cambodia (UNTAC), which brought in approximately USD 2 billion in a country (Vouthy, 2012) whose GDP was estimated to be only USD 2.5 billion in 1993 (World Bank, 2022c). By 1998, however, the exchange rate was stable while the consumer price index was maintained below 5 percent from 1999 onwards – except for a short-lived hike in 2008 in the context of global instability.

A long-term economic consequence of the UN intervention was the dollarization of Cambodia's economy. While dollarization was not a policy choice for Cambodia but rather the result of historical events that culminated with the UN presence, it

nonetheless brought some benefits as it reassured investors by considerably reducing the exchange rate risk in a potentially volatile political and economic environment. It, therefore, played a role in the initial stabilization of the economy and is still a factor of attractiveness for foreign investors, even though it limits the scope of the country's monetary policy.

Beyond the pros and cons of this unexpected dollarization and the stabilization of its prices and exchange rate, Cambodia has also been described by multilateral financial institutions as soundly managed from the macroeconomic perspective. Until 2020, the fiscal deficit was under control, and the debt-to-GDP ratio was kept below 30 percent while international reserves stood above the minimum requirement for an emerging economy (World Bank, 2021b). Even the shock induced by the COVID-19 pandemic has not dampened the overall positive appreciation of Cambodia's fiscal management by multilateral partners (IMF, 2021).

On top of the solid foundation of political stability and sound macroeconomic management, Cambodia has capitalized on structural advantages resulting from its demographic and business-friendly environment. From a demographic perspective, the Cambodian population is very young, with approximately 60 percent aged less than 25 years (UNICEF Cambodia, 2019). Owing to low wages, this abundant young population has remained affordable as a workforce, enabling Cambodia to position itself as a competitive recipient of foreign investment in labor-intensive industries. Foreign investors consistently ranked labor costs as one of Cambodia's main competitive advantages (EuroCham, 2015; EuroCham, 2017b; EuroCham, 2019b).

The Royal Government of Cambodia took a pro-business stance on the economic policy front. The Investment Law adopted 1994, amended in 2003, and again in 2021 exemplifies the country's willingness to attract foreign direct investment. Furthermore, the structural adjustments adopted as part of the IMF support program since 1994 have focused on the liberalization and privatization of the formally socialist economy (Slocomb, 2010). Among the measures adopted by the Government to position Cambodia as a foreign direct investment-friendly destination are the possibility of registering a 100 percent foreign-owned company, the creation of a one-stop window for investors with the establishment of the Council for the Development of Cambodia (CDC); the absence of discrimination against foreign investment in most sectors; the lack of foreign exchange control and price control; and a relatively moderate tax framework have been notable factors of attractiveness. Other vital regulations include adopting the Law on Banking and Financial Institutions in 1999. Admittedly, many issues remain, including weak enforcement of the legal framework and the lack of transparency, but overall, Cambodia has marketed itself as a pro-business economy where the level of public-private dialogue is among the highest in ASEAN (EU-ASEAN Business Council, 2018; EuroCham,

2016a; EuroCham, 2017a; EuroCham, 2019a). The Government-Private Sector Forum exemplifies this for public-private dialogue with more than a dozen sectoral working groups, each co-chaired by a representative of the Royal Government and an elected representative of the private sector.

Finally, Cambodia secured privileged access to international markets for its industries and services. The European Union (until 2020, see below) and the USA granted preferential market access to Cambodia's goods, a critical factor in attracting foreign direct investment and the launching pad for the garment and footwear manufacturing sector that today represents the most significant part of the country's employment, industrial production, and exports. Cambodia also resolutely joined the World Trade Organization (WTO) in 2004, another step showing its commitment to an open and unrestricted market economy that was reassuring for foreign investors.

On the services side, the inscription of the world-famous Angkor Heritage Park on UNESCO's World Heritage List in 1992, the adoption in 2000 of an open-skies policy making Siem Reap-Angkor an international airport, and a visa-on-arrival policy for several countries opened the door to millions of international arrivals. It made the tourism sector the second biggest employer in the economy. In nearly two decades, international tourist arrivals multiplied by 13 to reach 6.2 million in 2018 (Ministry of Tourism, 2019).

This combination of competitive advantages, political maturation, historical accidents, sound policies, and a purposeful opening to the world allowed Cambodia to champion growth and lift millions out of poverty within two decades (World Bank, 2019b). In 2015, the country fulfilled the World Bank's conditions to attain the lower middle-income status, and the Government openly stated its ambition to reach the upper middle-income status by 2030. Figure 4.1 shows Cambodia's competitive advantages.

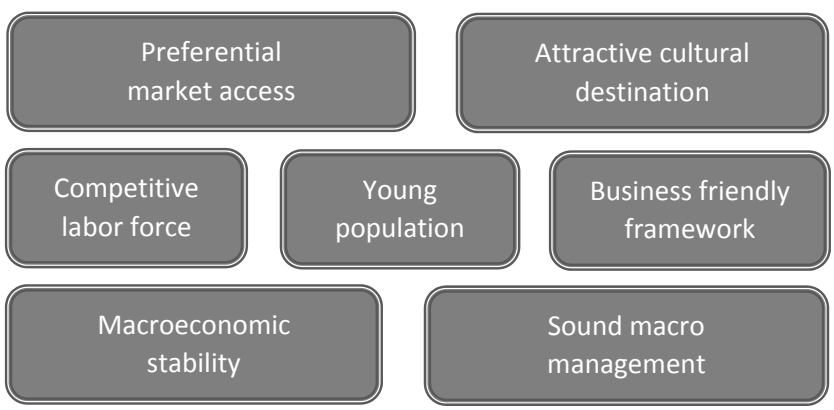

Figure 4.1: Cambodia's Combination of Competitive Advantages

The question, however, is to what extent this model that primarily relies on FDI-driven, cheap labor-intensive, and narrow-based industries can still serve its purpose in an economy that is being transformed by the day.

3. STRUCTURAL LIMITATIONS

Capitalizing on its competitive advantages, Cambodia attracted high levels of foreign direct investment, developed export-oriented industries, and fostered a thriving tourism industry, thus fueling two decades of outstanding economic growth. This growth has only slowed twice in twenty years: Following the global financial crisis in 2009 with a zero-growth rate and the unexpected shock resulting from the COVID-19 pandemic with a recession of −3.1 percent in 2020 (World Bank, 2022d). However, the Cambodian growth model contains limitations that became particularly visible during the 2020 recession. The steady growth of the past two decades has been highly dependent on a narrow base and a limited number of international partners. At the same time, a vast array of structural weaknesses hinders Cambodia's ability to reach the next level.

3.1 A Narrow-Based Economy

Cambodia's GDP growth has been driven by the garment, textile, footwear (GTF), and tourism sectors, which are considered the largest employers. A third contributor is agriculture, whose share in terms of value and employment has been continuously declining. A fourth sector is real estate and construction, whose contribution to the GDP has sharply risen to represent one-third of economic growth in 2019 (NBC, 2019).

Having secured preferential access to the US and European markets, Cambodia attracted a pool of Asian investors who set up factories to supply major global brands selling their products in Western markets. The garment and footwear manufacturing sector quickly became the largest employer in the economy, with about 880,000 workers in more than 600 factories[2] generate more than 70 percent of Cambodia's total exports (NBC, 2018). Likewise, the tourism industry grew exponentially following the launch of the open-skies policy in 2000. The second largest employer in the economy, the tourism sector, accounted for 630,000 jobs in 2019 (ADB, 2017; ADB, 2021a) and contributed around 32 percent of the GDP (OECD, 2018).

Agriculture before COVID-19, on the opposite of the two other sectors, had been declining both in the number of jobs and contribution to the GDP, with sectoral growth averaging only one percent between 2013 and 2017, down from 4.5 percent between 2008 and 2017 and 7 percent between 2003 and 2007 (OECD, 2018). While Cambodians are traditionally rural dwellers, agriculture could never

live up to its potential and has yet failed to modernize (Slocomb, 2010) even though the country exports rubber and, more recently, rice. Processing and certification capacities are lacking; irrigation has been slow to expand, and little value is created while the market is disorganized with informal middlemen exfiltrating large parts of the output of the main crops to be processed in neighboring countries; indeed, the Asian Development Bank estimates that "only about 10 percent of Cambodia's total agricultural outputs are processed within the country, whereas processed agricultural exports represent only 8 percent of total exports by value" (ADB, 2021b). As a result, the sector remains weather-dependent, and its contribution to the GDP could be more moderate, sometimes negative, as it can hardly export processed products that meet the standards requirements of international markets. It continues to play a buffer role in crises when laid-off workers can return to their family households in the provinces, as observed during the COVID-19 pandemic in 2020-2021.

Finally, the construction sector's contribution increased sharply, representing about one fifth of the country's economic growth and 220,000 jobs in 2018 (NBC, 2018). This growth has been fueled by both local and foreign investment, especially from China, with a risk of vast speculative projects,[3] but also to answer the demands of an emerging middle class and the needs generated by a rapidly growing population and rural exodus. The urban population increased from 19 percent in 2000 to 25 percent in 2022, with a significant acceleration from 2008 (World Bank, 2022e). While some segments may be oversupplied, and quality varies considerably from one development project to another, professionals in the sector believe that a long-term combination of demographic and economic growth will ensure sustained demand for real estate.[4]

Overall, the most significant part of Cambodia's GDP and employment has relied on a narrow base of only three sectors: Export-oriented garment and footwear manufacturing; tourism-focused essentially on the Angkor World Heritage site; and a recent construction boom. Just before the pandemic, these three sectors were estimated to contribute 70 percent of growth and 40 percent of jobs in Cambodia (World Bank, 2020a). While agriculture remains an essential component of the economy, its declining contribution and slow transformation keep it apart from the three other sectors – despite some exciting initiatives such as Kirisu Farm.

Consequently, when the garment and tourism sectors, and to a lesser extent the real estate and construction sector, suffered external shocks generated by the COVID-19 pandemic, the Cambodian economy shrunk by 3.1 percent. Cambodia's extraordinary resilience also met the crisis, but it reflected its strong dependence on a narrow economic base. By comparison, while ASEAN as a region entered a recession in 2021, the economies of Vietnam and Lao PDR kept growing slower (ASEAN Secretariat, 2021). Furthermore, Cambodia's growth model already displayed inherent weaknesses that constrained the potential for future expansion.

3.2 Relying on a Limited Number of Partners

The drivers spurring Cambodia's rapid economic growth depend on a limited number of partners in terms of input and markets. Indeed, the sources of Foreign Direct Investment (FDI) that have enabled the garment and footwear manufacturing sector's expansion, as well as a large part of the construction boom, point to a strong dependence on Chinese investors (Figure 4.2), who represent more than 40 percent of the total FDI in Cambodia, not even mentioning a 20 percent share from Hong Kong (World Bank, 2020b). Likewise, almost 40 percent of Cambodia's imports came from China in 2016, especially for the inputs necessary for garments and footwear production, and 32 percent of tourists arrived from China in 2018. This dependence on China, especially as a source of FDI, has often been stressed by observers, particularly multilateral institutions and Western analysts.

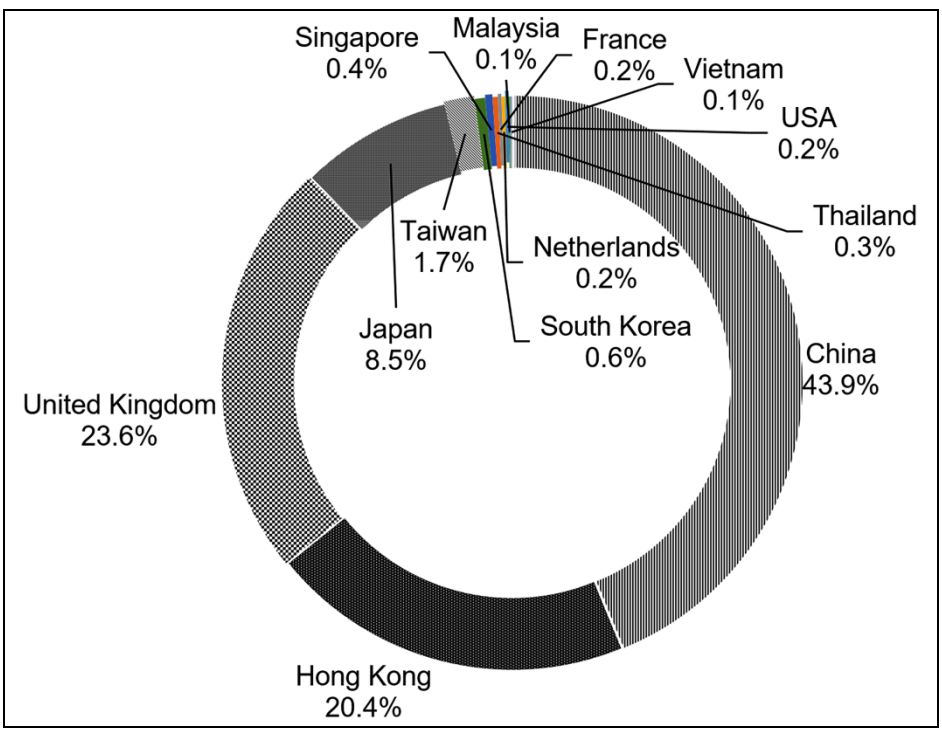

Figure 4.2: FDI Per Country of Origin (World Bank Economic Update 2020)

In addition, the dependence in terms of export markets is also very high, this time towards the European Union (EU) and the USA (Figure 4.3). In 2016, before the removal of the Everything But Arms (EBA) preferential scheme granted by the European Union, 35 percent of Cambodia's goods exports were destined for the EU and 21 percent for the USA (EuroCham, 2018a). Therefore, as of 2016, 56 percent

of the Kingdom's exports went to an economically synchronized and politically homogenous area. Beyond the risk brought upon by a potential conjunctural crisis in Western markets, the political dimension should also be considered, particularly when looking at the intensifying policy of sanctions adopted by the West towards countries that do not fit their political values. The temporary suspension of Cambodia's preferential access to the European Union market under the EBA trade scheme (European Commission, 2019) and the "high risk" advisory issued by the US State Department against investing in Cambodia (US Department of State, 2021) are testimony to the risk of depending only on Western partners while the political systems are not aligned.

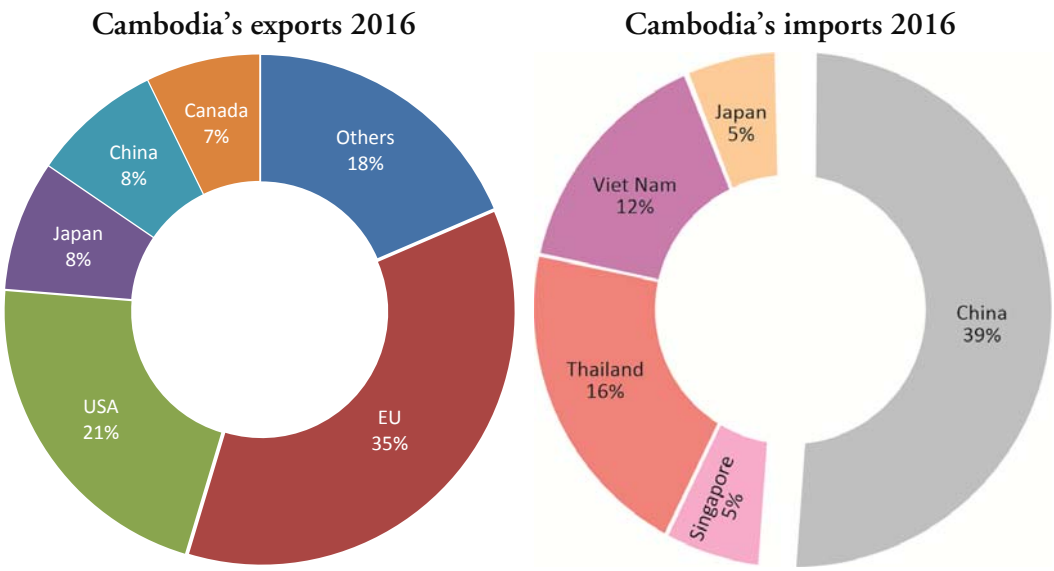

Figure 4.3: Imports Sources and Exports Destination (EuroCham Cambodia)

The question is about something other than reducing foreign direct investment originating from one country or the amount of exports directed to another country. It is about increasing other sources of investment and export markets to diversify partners and reduce the conjunctural and political risks inherent to dependence on a limited pool of investors, suppliers, and buyers.

3.3 Fueled by a Model that is Reaching Its Limits

While the economic model described above has served its purpose in enabling Cambodia to reach the lower middle-income status in 2015, it nonetheless contains inherent weaknesses that structurally limit the country's ability to continue growing towards its objective of becoming an upper middle-income economy by 2030.

According to EuroCham, the private sector's feedback gathered through surveys and public-private dialogue reveals a series of broad issues that need to be tackled to further the full potential of the Cambodian economy. Indeed, as the economy grows and becomes more sophisticated, solving these structural issues becomes a growing necessity. Three main categories look at the main structural issues that restrain the potential for future economic growth: quality issues, cost issues, and playing field issues.

The first broad category of issues concerns quality deficiencies that hinder productivity and increase value-addition. Among these, the availability of human resources is regularly cited by the private sector, especially foreign investors, as one of the main challenges of doing business in Cambodia, with the lack of skills being one of the reasons for this. Indeed, while reforms have been undertaken by the Ministry of Education, Youth, and Sport over the past few years, primarily to raise the standards in high school and to promote Science, Technology, Engineering, and Mathematics (STEM) in the education system, much remains to be done, especially in public schools. On the higher learning side, there remains a lack of adequation between the curricula offered to learners and the needs of the private sector regarding recruitment, contributing to what has commonly been called the "skills gap" (ADB & ILO, 2015). With limited skilled human resources, it is challenging for the private sector to increase productivity unless the company invests in additional training. Furthermore, the general need for standards in management and processes results in low-quality goods and services that leave no prospects for creating value-added. On the government side, the bureaucratic procedures and public services to the private sector, for instance, related to labor and tax matters, are also signaled by the private sector as impacting the ease of doing business in the Kingdom. Only some ministries can boost a level of competencies equivalent to the one that can be found in the most efficient private sector companies.

The second category of issues concerns the pressure put by various costs on the profitability of businesses. With twenty years of almost consecutive growth, wages have regularly increased, especially in the garment and footwear industry, where a minimum wage system is set by law and negotiated every year between representatives of the employers, workers, and the Government. While the low cost of human resources remains one of Cambodia's top comparative advantages, such a regular wage increase in the context of limited productivity puts pressure on the businesses' profitability. Despite recent improvements, the private sector considered the rise in cost, especially electricity and logistics fees, as an additional burden compared to the rest of ASEAN (OECD, 2018). An extra layer impacting profitability is the wide range of informal fees and non-transparent practices whose continued existence makes other costs less tolerable. In a general context of limited access to finance, the persistent issue of high costs impacts businesses' decision making and development prospects.

The third category of issues is related to the complaints by the private sector, especially but not exclusively foreign investors, against unfair competition and the general feeling that Cambodia could do better as a level playing field (Figure 4.4). Most of this feedback concerns an unsmooth interpretation of regulations, the need for coordination among state agencies, and measures not taken against uncompliant businesses. Unfair competition regularly stands at the top of obstacles to doing business raised by the private sector. In thirty years, the landscape of doing business in Cambodia has been transformed from a time when the legal framework was both limited and mainly unimplemented to a time when compliance and the expansion of the formal economy are becoming a priority for the Government. Indeed, the necessity to manage an increasingly diverse range of business activities (born from the multiplication of segments and emancipated consumer behavior) and to collect more taxes from substituting domestic revenues for foreign aid has opened the door to expanding the legal framework and tighter implementation of regulations. In the tax and customs areas, registration, audits, and penalties are on the rise, with the private sector complaining that voluntary compliance too often leads to punitive audits and penalties. At the same time, many non-compliant businesses can still "get away with it." Additionally, the multiplication of new regulations and the now tighter implementation of previously existing ones have led to increased gaps in the interpretation of the law between the private sector, the regulators, and the civil servants, a matter of concern in an environment where compliance matters more than ever.

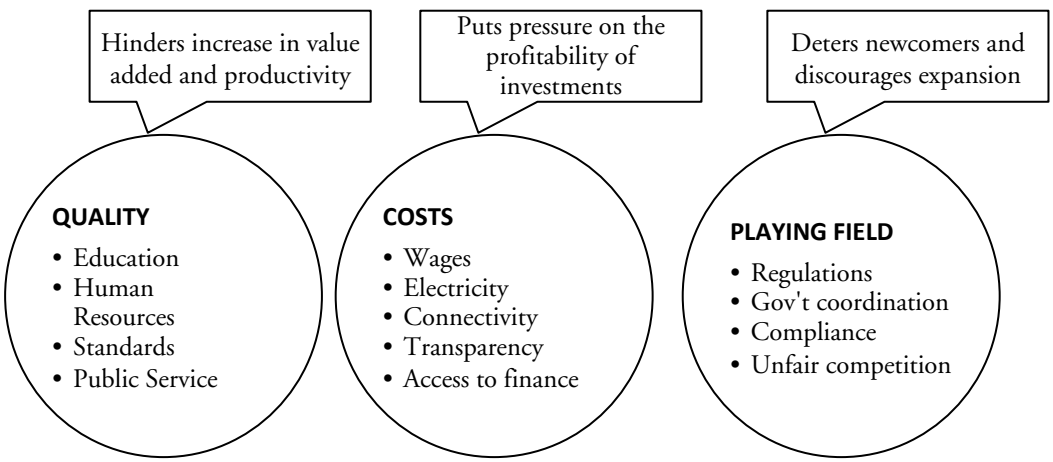

Figure 4.4: Cambodia's Structural Challenges

Beyond the abovementioned issues impacting Cambodia's attractiveness as an investment destination, additional observations offer a broader perspective on the Kingdom's economic landscape.

The first observation concerns the limited diversification of Cambodia's export-oriented industrial production. For more than two decades, Cambodia has focused on promoting cheap labor-intensive export industries that can be summarized as garment and footwear manufacturing. As of 2015, only 5.6 percent of Cambodia's manufactured exports were made of non-garment and shoe products (CDC, 2021).

A second observation is related to the quality of Cambodia's exports, whose medium and high-tech proportion remained below 10 percent as of 2019 (CDC, 2021). The Cambodian garment industry is based on the Cut-Make-Trim model, which implies that most of the inputs are imported to be assembled onsite in labor-intensive factories employing low-skilled workers. Overall, the domestic component of value added in the Cambodian exports does not exceed 10 percent, leaving a considerable margin for increase should techniques, skills, and local inputs improve. While this can be considered a regular pattern in the increased global integration of an emerging and export-driven economy, it also points to the almost complete absence of domestic backward linkages in the Cambodian economy[5] and, by extension, to the inefficiency of the domestic industry landscape.

A third observation concerns the vast landscape of informal small and medium enterprises that must be fully accounted for in growth and employment figures. Indeed, in 2016, it was estimated by the Ministry of Industry, Sciences, Technology and Innovation (MISTI) that only 64 percent of small enterprises and 83 percent of medium enterprises were duly incorporated (CDC, 2021). These figures may need to be more accurate as it is always risky to assess what one cannot count, and also because some businesses may have registered with other authorities than MISTI. However, they give an idea of the proportion of the informal economy in the SME landscape. While they represent a considerable number of jobs and activities, the non-registered small and medium enterprises are managed with shallow standards for everything related to corporate governance, bookkeeping (according to the General Department of Taxation, only 13 percent of small enterprises had basic bookkeeping, and 35 percent of medium enterprises had a balance sheet in 2016 (CDC, 2021), labor, skills, production processes, product quality, certification, and others. Thus, they could be more efficient. This vast landscape of informal, substandard, and low-skilled SMEs needs to be connected to the most dynamic parts of the formal economy.

This disconnection between the formal and informal economy also explains the high level of import dependence that characterizes the more dynamic, foreign investment-driven, and export-oriented industries, as it makes domestic backward linkages almost impossible. The standard requirements of an industry that exports to more advanced markets are too high for substandard informal industries to supply local inputs or services. Inefficiency hinders the potential for growth and the creation of local value added. Admittedly, raising the standards of this SME landscape would not

only increase the size of the economy and earn more revenue for the State but also open the way for creating more value in the economy.

On the services side, the tourism industry also showed limitations. Efforts have been undertaken with mitigated success to diversify Cambodia's offer as a destination by promoting the coastline (15 percent of international arrivals in 2017), ecotourism areas (a long-proclaimed but hardly achieved objective with only 2 percent of international arrivals in 2017), and new heritage sites inscribed on the World Heritage List such as the Temple of Preah Vihear and the ancient capital-city of Sambor Prei Kuk. Despite these efforts, most of the 6 million tourists who visited the Kingdom before COVID-19 still went straight to Angkor, with the Siem Reap International Airport accounting for 60 percent of international arrivals by air in 2017 (World Bank, 2017).

This lack of diversity, compounded by limited infrastructure for travel and accommodation throughout the country,[6] could be a reason for the persistently short duration of stay, which remained below one week before COVID-19 and even declined between 2013 and 2016, as did the average daily spending (World Bank, 2017) in a possible illustration of the usual interrogation raised by the tourism industry: "what to do besides the temples?" Regardless of COVID-19, tourism visitors and revenue growth had already decelerated in 2019, another indication of the difficulty for the tourism sector in keeping up with the booming pace of the previous decades.

An estimated 40 percent of generated revenues are lost through excessive reliance on imported human resources, services, and products. The high proportion of leakages is another weakness restricting the tourism industry's contribution to national wealth (World Bank, 2017). This issue is connected to the abovementioned challenges, such as the skills gap, the lack of standards requirements in goods and services, and the dependence on foreign investors and supplies.

Like in other sectors, a fair share of tourism businesses needs to be registered and, therefore, stays off the authorities' radar. Most of the hotels and guest houses below four stars are believed to be either entirely or partially unregistered with the Ministry of Labor and Vocational Training, the General Department of Taxation, and even the Ministry of Tourism.[7] While standards are higher in this sector as it is necessary to satisfy millions of foreign visitors every year, the next section of this chapter will show how the low registration rate proved to be doom when the COVID-19-induced crisis hit the Cambodian economy.

While Cambodia has achieved outstanding socio-economic development on all fronts, the growth model on which it has relied for more than two decades contains inherent limitations that question its ability to continue growing at the same pace. Before looking at the structural transformations that will allow us to overcome these

limitations, it is interesting to examine how the crisis induced by the COVID-19 pandemic highlighted these weaknesses.

4. COVID-19 HIGHLIGHTED WEAKNESSES

4.1 Growth Drivers on a Halt

In late January 2020, Cambodia reported its first case of COVID-19. The entire economy soon suffered the consequences of the global slowdown triggered by the pandemic. The main growth drivers stopped, unemployment shot up, and the country entered a recession.

On the garment and footwear manufacturing front, Cambodia suffered from two shocks. First, its supply of inputs was disrupted due to lockdowns and restrictions imposed in China. The Cambodian Government, however, was quick enough to capitalize on its privileged relations with Beijing to secure emergency supplies for the garment industry (Lancang-Mekong Cooperation, 2020). While this issue seemed to be solved, demand from the Western markets dived due to the global slowdown and transportation bottlenecks. Orders books remained empty for 60 percent of factories (World Bank, 2020a), with buyers pressuring for lower prices in a sector already perturbed by the prospect of losing the EBA preference. Within a few months, Cambodia's aggregated exports of goods plunged, including for the burgeoning travel goods markets that represented a promising option of diversification and higher value added.[8] Just three months after the global outbreak, more than 50 factories had closed, and 35,000 jobs had been suspended or terminated. By July, the Garment Manufacturing Association of Cambodia (GMAC) announced the suspension of 400 factories and the loss of 150,000 jobs, with many more at risk (Vantha, 2020). In January 2021, the estimated suspension of 526 factories impacted 349,000 workers (RGC, 2021).

The shock was even more severe in the tourism sector, with an almost complete halt of international arrivals. During the first two months of 2020, tourist arrivals to Cambodia contracted by 25.1 percent, including a decline in 45.6 percent of tourist arrivals at Siem Reap during the first quarter of 2020 and a 99.6 percent contraction in April 2020 (World Bank, 2020b). By March, one hotel out of four was closed in Siem Reap, and dozens of thousands of workers were laid off. The tourism industry entered panic mode, with multiple calls for the Government to intervene and avoid a complete devastation of the sector.

The real estate and construction sector did not feel the full impact of the crisis before 2021 but also saw a significant segment slowdown in 2020, with the boom of the past years coming to a halt. Construction permits contracted 9 percent against a 98 percent growth the year before. Imports of construction materials also contracted

(World Bank, 2020a), an announcement that the crisis would last until 2021 in this sector.

With its three primary drivers impacted, Cambodia's economy shrank by 3.1 percent in 2020, only saved by agriculture. While growing at its usual low rate, the latter played a vital buffer role, absorbing part of the hundreds of thousands of laid-off workers who could travel back to their family households in the provinces.

4.2 The Difficulty of Salvaging Businesses that do not Exist

The recession highlighted the danger of Cambodia's dependence on a narrow base and the precarity in which the large informal segments of the economy would find themselves in times of crisis. With Cambodia being one of the ASEAN countries where public-private dialogue is the most dynamic (EU-ASEAN Business Council, 2018), business and industry associations quickly contacted their government counterparts. Calls were made for extraordinary measures to prevent irreversible damage to sectors that had benefitted from decades of investment (EuroCham, 2020). There were intense discussions to find solutions and protect businesses and employees from a complete collapse. The Ministry of Economy and Finance was a main interlocutor of the private sector and coordinated the elaboration of 10 rounds of measures adopted over two years to ensure the survival of businesses in the most impacted sectors. The National Bank of Cambodia was also actively engaged by encouraging voluntary loan restructuring within the banking system and liquidity-providing measures (The Banker, 2020).

The most critical fiscal measures adopted to support the private sector in facing the dire consequences of the crisis included short-term tax exemptions that were regularly renewed and subsidies to suspended workers. These measures were applied only to the most impacted tourism and garment manufacturing sectors. In addition, the provision of preferential loans and co-financing schemes to SMEs was ensured through the SME Bank, established in 2020 by the Ministry of Economy and Finance, to answer the short-term needs related to the crisis and address the broader issue of limited access to finance for entrepreneurship. Other subsidies also took place beyond the private sector in cash transfers to the poorest.

While these measures did help to soothe the financial pain of their beneficiaries, whether these were business owners facing working capital asphyxia or suspended workers whose salaries had been partly or entirely lost to the crisis, they could only be of help to those who stood within the sphere of the formal economy. Indeed, nonregistered businesses and undeclared employees could hardly apply for government support since they legally did not exist. The issue was particularly true for the tourism industry, where the level of compliance has historically been shallow. As the pandemic-induced crisis climaxed in Siem Reap, only about 10 percent of

hotels had applied for tax exemption to the Ministry of Economy and Finance or employees' subsidies at the Ministry of Labor and Vocational Training. Indeed, nonregistered businesses and their employees discovered that while tax evasion could be comfortable in times of prosperity, it also excluded them from any rescue package in times of crisis. COVID-19 thus provided yet another pressing reason to expand the size of the formal economy.

Likewise, while the recession particularly wreaked havoc on the tourism industry, with nearly all the hotels in Siem Reap closing and their workforce being disbanded, it was difficult for the Government to make a precise assessment of the damages inflicted since many impacted businesses were not registered and were therefore off the Government's radar. For instance, in July 2021, the Minister of Planning suggested that 3,000 businesses had closed and 45,000 employees had lost their jobs in the tourism industry, an estimate that the private sector considered below reality. However, in the same interview, the Minister evoked the gigantic 6 million workers impacted by the informal economy (Phnom Penh Post, 2021). The large size of the informal economy prevented the creation of a more comprehensive safety net and an accurate assessment of the losses incurred in revenue and employment.

COVID-19 highlighted the structural limitations of the economic model that had fueled Cambodian growth for two decades, whether its narrow base, limited pool of international partners, or the large size of its informal economy. The Cambodian Government had been aware of these weaknesses. While COVID-19 catalyzed accelerated reforms, an overall structural transformation of the economy had already been engineered through a series of policies and actions.

5. ACCELERATING STRUCTURAL TRANSFORMATION

5.1 The Necessity for Structural Transformation

The Royal Government of Cambodia identified the challenges to sustaining high growth relatively early towards reaching the upper middle-income status by 2030. The country needs to move beyond its cheap-labor intensive model towards a more diversified economy that creates higher value added. It needs to balance sectors' contribution to growth, especially by improving agriculture; it needs to strengthen the SME landscape, improve its standards, plug it into foreign direct investment, and connect it to export markets; finally, it needs to accelerate the formalization of its economy and improve guarantees given to investors in such fields as fair competition, transparent and efficient public services, and protection of intellectual property to name the most vital (EuroCham, 2019a) areas.

The Government and its multilateral partners, such as the World Bank, the IMF, and the ADB, agreed on the challenges to be addressed, and corresponding objectives

have been stated in defining government policies. In 2018, Phase IV of the Rectangular Strategy, the cornerstone of the Government's political platform, "emphasized the need to seek new growth sources to ensure high and sustainable economic growth by taking full advantage of the regional opportunities, creating value added in the existing economic pillars and their related sub-sectors, encouraging investment in agriculture, ensuring readiness to grab new technologies in the era of digital economy as well as to grab opportunities and to overcome potential challenges in the context of industrial revolution 4.0, and enhancing Cambodia's competitiveness in response to new concerns and demand from the people in new development phase and our goal of becoming an upper middle-income country by 2030 and a high-income country by 2050."[9]

In 2015, the Royal Government launched its flagship Industrial Development Policy (IDP) that aimed to "maintain sustainable and inclusive high economic growth through economic diversification, strengthening competitiveness and promoting productivity." The Government announced the formulation of the IDP in Phase III of the Rectangular Strategy adopted in 2013 to move the country "to a higher value chain in the regional and global economy, especially within the rapidly growing Asian market, while paying attention to upgrading skills and vocational training for Cambodian workers." The IDP is indeed based on two critical approaches: (1) expansion of the industrial base supported by increased attractiveness of Cambodia to investors and investment promotion, including modernization of SMEs, and (2) improved connectivity with regional production networks to integrate with and move up the global value chains." On the tourism side, vocational training, market diversification, attempts to tap into the gigantic Chinese reservoir of travelers (Phnom Penh Post, 2017), and campaigns to promote a higher supply of domestic goods and services have also been undertaken, with more or less success.

In addition, other reforms have been carried out to strengthen, support, or complete the realization of the above-described objectives. The most overarching one is the 2019-2023 National Strategic Development Plan, which includes references to industrial diversification, value-added, and promotion of the agricultural sector. More specific tools include the SME Policy, the Master Plan on Intermodal Transport Connectivity and Logistics System, the Digital Economy Framework, the Science, Technology, and Innovation Road Map 2030, and the National Employment Policy 2015-2020.

5.2 Slow Changes

The implementation and impact of the IDP have been monitored by the CDC, which is in charge of its overall coordination. The word coordination matters here because while the CDC is indeed the one-stop window for foreign investment, the

authorizations it delivers have to be implemented by other institutions such as the General Department of Taxation, the General Department of Customs and Excise, and other bodies that are not under the authority of the CDC. As the need for proper coordination among ministries in Cambodia is one of the significant obstacles to the ease of doing business, this is an essential point to stress.

The IDP indicators monitored by the CDC show that structural transformation is slowly happening, although not always at the pace expected. Industrial diversification has been taking place, with the share of non-garment manufactured exports growing from 5.6 percent in 2015 to 15.5 percent in 2020. Results on the agriculture side remain below expectations, with the share of processed agricultural goods declining from 5.8 percent to 4.9 percent of exports, even though it has increased in value in the same period (CDC, 2021). Overall, garment exports no longer account for most of Cambodia's goods exports as of April 2021 (World Bank, 2021b).

Besides a surge in bicycle exports, Cambodia became ASEAN's largest supplier of bicycles to the European Union in 2017 (ScandAsia, 2021), and the production of electrical and vehicle parts has also been increasing. This type of diversification is mainly ensured by Japanese foreign direct investors (Phnom Penh Post, 2022), who build workers' skills through dedicated training programs that increase productivity.[10] This component is incentivized through the new Law on Investment adopted in 2021. Companies like Sumi Cambodia (wiring systems), Denso (automotive and motorcycle parts), and especially Minebea (precision electronic components) have opened factories in Cambodia over the past decade. In late 2021, the General Manager of one of the largest Special Economic Zones shared with the author that his Japanese tenants had reported constant productivity increases following personnel training. Other investors, such as RMA, Daehan, and others, are setting up vehicle assembly factories in the Kingdom. The same General Manager who had noted the absence of domestic backward linkages in 2018 reported in 2021 that such linkages are now finally taking place in the form of a few foreign investors opening factories in Cambodia to supply inputs to other export-oriented foreign investors.

5.3 Policies Continue Unfolded

The new Law on Investment, adopted in late 2021, is the most recent initiative to foster this necessary structural transformation of the economy. This law has a much broader scope than its previous versions, expanding the list of incentivized sectors (EuroCham, 2021) to include tourism, education, vocational training, SME clusters, and the digital industry, among many others. It also introduces tax incentives for research and development, skills training, and corporate social responsibility to enhance competitiveness, diversification, productivity, and technology transfers.

The Government is also taking steps to address investors' concerns regarding unfair competition, such as enacting the 2021 Competition Law and adopting a Consumer Protection Law in 2019.

The Government has intensified its support for SMEs. In 2020, the Ministry of Economy and Finance launched the SME Bank to address the long-decried limited access to finance facing local SMEs. Offering "better access to financing" at a "cheaper cost," the SME Bank also provides advisory services to its clients to improve productivity and succeed in securing export markets. Earlier in 2019, the Ministry of Economy and Finance established Khmer Enterprise - a specialized institution tasked with providing financial and non-financial support to "entrepreneurs, innovative startups, potential SMEs and partner institutions who participate in promoting entrepreneurial activities driving innovation and value-added creation in Cambodia's economy." The future will ascertain whether these two innovative bodies and similar initiatives will make a difference and contribute to upgrading the Cambodian SME landscape.

Another essential tool launched before COVID-19 is the digitization of public services. As early as 2015, the Ministry of Commerce initiated an online business registration system, which was soon followed by more initiatives in other government services. The ultimate objective was to create a single window and database for business, tax, and labor registration. Admittedly, the aim is not only to improve efficiency and shorten delays but also to limit human interaction and reduce the risk of non-transparent practices.

At the same time, the public and private sectors are striving to promote the digitization of SMEs, a trend that will help to overcome inefficiency issues. Since 2015, the Ministry of Posts and Telecommunication has partnered with the then Ministry of Industry and Handicraft to encourage tech startups and Micro, Small and Medium Enterprises (MSME) digitization (EuroCham, 2018b) before launching the "Digital Cambodia" fair in 2019 and transforming the former National Institute of Posts, Telecommunications, Information and Communication Technology (NIPTICT) into a newly revamped Cambodia Academy of Digital Technology (CADT). Further capitalizing on these initiatives, a "Digital Economy and Social Policy Framework of Cambodia 2021-2035" was adopted in early 2020, and the Ministry of Industry and Handicraft was revamped into a Ministry of Industry, Science, Technology, and Innovation. Recognizing the importance and broader scope of the digital economy, an E-Commerce Law was also adopted in 2021.

With Cambodia having successfully tamed COVID-19 through high vaccination rates and other targeted measures, the country could reopen fully before other central destinations in Southeast Asia (particularly Thailand, of which Cambodia had long been a satellite destination). Tourism professionals hailed this achievement as a

unique opportunity for Cambodia to position itself as a full-fledged destination instead of a next-stop destination.[11]

On the foreign trade front, Cambodia's ratification of new free trade agreements is opening the way toward further integration into regional and global value chains with a better repatriation of the Kingdom's foreign partners. The free trade agreements signed with China on the one hand and with South Korea on the other hand, which entered into force in 2022, lifted tariffs on more than 90 percent of products originating from each country and provided opportunities for more foreign direct investment. Mainly, there is hope that these free trade agreements will contribute to finally unlocking the long-dormant potential of Cambodia's agriculture sector by moving from the already increasing fresh fruit exports. The protocols on phytosanitary requirements have already been signed between China and Cambodia for fresh mangoes and bananas (Xinhuanet, 2020) for processed product exports. Thanks to foreign direct investment, processing capacities will be developed to meet the export markets' standard requirements (DFDL, 2021). Even more importantly, the 15-member Regional Comprehensive Economic Partnership brings considerable opportunities for Cambodia's deeper integration into Asian value chains due to favorable rules of origin in what will be the largest free trade area in the world. Therefore, these three free trade agreements can contribute to balancing Cambodia's dependence on Western markets – although they may also deepen Cambodia's dependence on the Chinese economy. Finally, Cambodia's insertion into the Chinese Belt and Road Initiative contributes to the Government's strategy of capitalizing on the Kingdom's central position in ASEAN through physical infrastructure development.

With the recession highlighting Cambodia's structural weaknesses, the Royal Government integrated its existing policies into a "Framework for Post-COVID-19 Economic Recovery Plan 2021-2023" designed by the Ministry of Economy and Finance. As part of this Recovery Plan and its three-pronged approach ("Recovery – Reform – Resilience"), three areas were identified for short-term action: SMEs, agriculture, and tourism. Further, two sectors were identified for potential short to medium-term action: digital trade and assembly industry (RGC, 2021).

5.4 Priorities for a Structural Transformation

Figure 4.5 summarizes the mechanism transforming Cambodia into a more diversified, efficient, and inclusive economy. The current structure represents the Cambodian economy as a pyramid. On top of that pyramid is a dynamic, foreign investment-driven, export-oriented layer comprising manufacturing and tourism industries. This layer has driven Cambodia's past growth in association with construction and real estate. However, it must diversify its production and markets to grow and add value.

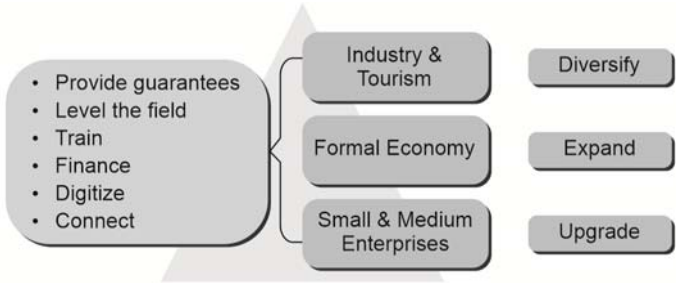

Figure 4.5: Cambodia's Road to Structural Transformation

The second layer is the formal economy. It comprises all businesses beyond the first layer that fulfill a minimum set of requirements in terms of business, tax, and labor registration and, therefore, contribute to the economic growth accounted for by the national accounts. This formal economy needs to expand as fast as possible to further Cambodia's transformation into a modern economy that generates, collects, and redistributes enough wealth to rely on itself and not only foreign donors' support. This layer also needs support to constantly uplift its standards in terms of governance, quality, and innovation so that it can partner with the first layer and create backward linkages for the manufacturing industry, reduce leakages in the tourism industry, and conquer export markets for its products and services, or cater to the ever-growing demands of the emerging Cambodian middle-class.

At the bottom is the third layer: a large, informal, inefficient SME landscape representing numerous businesses and employees providing sub-standard products and services to the domestic market. This bottom layer needs upgradation to become part of the formal economy and join the second layer. It must be formalized and contribute to the national accounts. This layer is the largest but least efficient layer and generates the smallest value added. Its workers and employees are also the most vulnerable in times of crisis.

The policies strengthening Cambodia's competitiveness and attractiveness are the tools to diversify the top layer, expand the middle layer, and upgrade the bottom layer. These policies include providing guarantees to investors, leveling the playing field, training the workforce, ensuring access to finance, expanding domestic and international physical connectivity, and accelerating the digitization of the economy and public services.

6. CONCLUDING REMARKS

The past three decades have seen Cambodia's economy undergo extraordinary changes as it transitioned from socialism to a free market, experienced unplanned and massive dollarization, and finally turned itself into a foreign investment-driven, export-oriented producer of goods and services.

As COVID-19 generated an unprecedented external shock on Cambodia's economy, the crisis catalyzed the acceleration of Cambodia's structural transformation towards a more diversified, skills-based economy capable of generating more value added.

The multiple reforms and policies engaged by the Royal Government target vital areas to achieve Cambodia's aim of attaining an upper-middle income status by 2030. However, success in their implementation will depend on how the Government productively addresses cross-cutting challenges.

One of the most critical challenges is the need for inter-ministerial coordination. As Cambodia's economy becomes increasingly sophisticated, coordination is necessary to improve the ease of doing business in the Kingdom. Too often, what looks like an easy road map is hindered by an absence of communication and mutual understanding between different ministries, resulting in frustration and even failure for investors.

As far as public service is concerned, digitization will only bear fruits if it is ultimately achieved. As the General Manager of the Special Economic Zone (SEZ) stated, "real digitization means no paper, no human, and only electronic signature." Digitization can improve the ease of doing business in Cambodia if it is comprehensively implemented. Again, this will demand coordination among ministries as the ultimate objective is consolidating the database of commerce, tax, and labor registrations.

This challenge is connected to the fair implementation of all regulations, a decisive factor in attracting and fostering quality investment, whether domestic or foreign. A level playing field with clear rules will attract responsible investors ready to compete fairly. On the contrary, an uneven playing field, whether because some are favored instead of others or because rules are ill-interpreted and ill-implemented, will attract the type of investment that thrives on non-compliant practices.

On the private sector side, the next big challenge is related to the overall quality of Cambodia's products and services. While many steps have been made to improve standards in all fields (education, management, bookkeeping, products, services, and others), quality cannot be decided by decree. The efficient implementation of institutions requires building necessary capacities, such as the transformation of the Ministry of Industry and Handicrafts into the Ministry of Industry, Science, Technology, and Innovation, the strengthening of the Institute of Standards and other similar institutions, the adoption of specific regulations related to product quality (included for imported products such vehicles or food and beverage). Standards are not only about equipment but, above all, about human skills; setting up a regulatory framework without enough human competencies may lead to counterproductive results in implementation, including safety risks for the consumer

and the usual ordeal of unfair competition if both the inspector and the vendor do not understand the standards that are required by the law. This challenge highlights the absolute necessity of furthering all efforts carried out in the fields of education and vocational training.

Beyond Cambodia's control, the international conjuncture may help or slow down ongoing progress. The US-China tensions, the current conflict in Ukraine, and other crises, such as the situation in Myanmar, are variables over which Cambodia has no control but that may bring unexpected consequences to the country. Their impact can be positive or negative, with the realignment of FDI flows, inflationary shocks, renewed Cold War pressure, and more.

Ultimately, both the public and the private sectors will have to build the conditions that warrant a successful structural transformation, sometimes individually, often hand in hand. Succeeding in this endeavor will enable Cambodia to resume steady growth in an ever-changing international context and achieve its goal of becoming an upper-middle income economy by 2030.

ENDNOTES

1. Figures from the World Bank. https://data.worldbank.org/
2. The Garment Manufacturers Association in Cambodia (GMAC) communication.
3. See contents of the EuroCham 2019 Real Estate and Construction Forum panel on Investment Opportunities, where a Chinese speaker explained the business model of real estate projects designed by Chinese developers to be marketed to Chinese audiences living in China, on the prospect of reselling them with a margin on the medium-long term.
4. Communication by the General Manager of a leading construction project management company.
5. This was an observation shared during the EuroCham Logistics Forum's panel on Investment Readiness in 2018, which the author moderated.
6. Discussion with a seasoned tourism industry professional, 2019.
7. The author communicates personally with industry leaders and is supplemented by direct observation during the COVID-19 crisis.
8. While export growth towards the European Union became negative, it only slowed towards the USA.
9. 'Cambodia's medium-term outlook and policies to enhance competitiveness' – talk by His Excellency Sok Chenda Sophea, former minister attached to the Prime Minister and Secretary General of the Council for the Development of Cambodia, at the Center for Strategic and International Studies virtual public webinar on "The future of work in the Mekong subregion."
10. The author communicates personally with representatives of the Japanese business community.
11. The author communicates personally with tourism professionals focused on Western markets.

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CHAPTER 5

The Measurement of the COVID-19 Pandemic in Cambodia Using the SIR Model

Siphat Lim

1. INTRODUCTION

The spread of COVID-19 started at the end of 2019 in Wuhan province of China. The relevant authority hardly controlled the spread of the disease due to the virus being new and infected via the breath, the non-availability of vaccine, the lack of enough Personal Protective Equipment (PPE), the non-availability of adequate testing facilities, including the inadequate hospitalization facilities, such as limited numbers of available beds in hospitals for the patients. The lack of these facilities led to ineffective control of the pandemic. The new daily infected cases in Cambodia, a seven-day rolling average, was 528 (ABVC, 2021). Some strategies were carried out by the authorities in the infected areas to control the transmission of the virus. Those strategies were social distancing (including reducing public transportation, closing schools, banning funerals and weddings, and keeping people out of the streets), wearing masks, a centralized quarantine system, curfew, and lockdown. During the period of the pandemic, lockdown in the infected areas, even though it had a substantial adverse economic impact, was considered one of the most popular policies, generally carried out by government authorities in some countries, such as China and other European nations, such as Italy, Spain, France, and the United Kingdom that the level of infection was very high at the start of the pandemic in the early of 2020.

The government must predict the level of infection of the COVID-19 disease all over the country when it reaches the peak or turning point. To define the turning point of the total infection rate, the SIR model is employed to simulate three observed variables: Susceptible, infected, and recovery or deceased. The simulation of the model can be carried out by estimating two parameters: Contact rate and recovery rate. This chapter further tried to investigate the effectiveness of potential strategies, including curfew, lockdown, vaccination, and social distancing policy, which the Royal Government of Cambodia (RGC) can employ to cope with the COVID-19 pandemic. A multiple regression model is used between total infected cases and the four policies that have just been mentioned. The Ordinary Least Square (OLS) is applied in producing the sample parameters.

The following section of the chapter reviews the empirical studies in this direction. Following this, the chapter discusses the methodology used in this study. The empirical results and discussions, followed by the conclusion, are presented in subsequent sections.

2. LITERATURE REVIEW

The outbreak of COVID-19 first occurred in Wuhan of Hubei province, China. The central government of China imposed a lockdown on Hubei on January 23, 2020, to control the outbreak. The Bass-SIR model was applied to investigate and analyze the spread of the COVID-19 pandemic following Wuhan's lockdown between January 24, 2020, and February 12, 2020. The model used three variables: Cumulative infected cases, cured cases, and death cases in all provinces in China, excluding Hong Kong and Macau. The main objectives of this research were to determine the reproduction numbers and the adequate reproduction numbers to forecast the expected outbreak, the second wave, which might happen shortly. The exogenous impacts of the lockdown policy were also evaluated using the simulation analysis. This study found adequate reproduction numbers around two in Hubei, Heilongjiang, and Guizhou, but the numbers were close to one in other provinces by February 12, 2020. The exogenous force of infection, at 95 percent credible interval (CrI), was found to be 31 percent (CrI: 12-55 percent) and 19 percent (CrI: 5-44 percent) in Fujian and Shanghai despite Wuhan's lockdown. In addition, the second epidemic wave was predicted to occur on February 24, 2020 (Ku *et al.*, 2020).

The study of the outbreak of coronavirus in China, Italy, and France was conducted using the susceptible (S), infected (I), recovered (R), dead (D) scheme (SIRD) model on the period covered from January 22, 2020, to March 15, 2020. Excluding the recovered and dead number, the maximum number of infected individuals was predicted to be 26,000 in Italy, which is expected to happen on March 21, 2020. The result of this study showed a definite universality in the evolution of COVID-19 in China, Italy, and France, as indicated by the time-lag plots of the confirmed infected populations (Fanelli & Piazza, 2020).

Reproduction numbers, Rt, inferring the total population infected or attack rates of COVID-19 had been estimated in 11 European countries using a semi-mechanistic, joint Bayesian hierarchical model. This study further investigates the effectiveness of policies carried out by each country to reduce the mortality rate. The models that represent the number of infections, number of deaths, and number of reproductions were created. Between March 2 and March 20, 2020, government policy intervention had been put into action. Italy began to apply non-pharmaceutical interventions (social distancing encouraged, closing schools and universities, banning public events, case-based isolation, onset of first intervention and lockdown).

Effective policies aim to reduce the death rate to the lowest level. The death rate was observed until May 4, 2020. The initial average of Rt across all countries was estimated to be 3.8, with a credible interval between 2.4 and 5.6. This number is reduced owing to the combined non-pharmaceutical interventions. As of May 4, 2020, the highest attack rate was found in Belgium, at 8 percent of the total population. The rates were 5.5 percent and 4.6 percent in Spain and Italy, respectively. The lowest attack rate was found in Germany, estimated to be 0.85 percent of the total population. Two models were developed, with and without intervention, to predict deaths in 11 European countries. Had appropriate intervention policies been carried out at the start of the pandemic, the cause of the deaths would have been reduced by 3.1 million people across the 11 European countries. This research further revealed that the predicted infection rate was higher than reported. The deviation might have come from the test to detect COVID-19 infection. The high uncertainty of infection estimated here may be due to the focus on hospital test settings that miss out on mild or asymptomatic cases in the community. Reproduction numbers were reduced by 81 percent at the credible interval between 75 percent and 87 percent if a lockdown was implemented (Flaxman *et al*., 2020).

One of the most famous mathematical models, the SIR model, was constructed to analyze the COVID-19 outbreak in the Kingdom of Saudi Arabia (KSA). The basis of the SIR model was created on the fundamentals of three subsets: Susceptible (S), Infected (I), and Recovered (R). Ordinary Differential Equation (ODE) was developed under these subsets. Two parameters, effective contact and recovery rates, were derived by solving ODE. The main objective of the study was to predict the pandemic situation in the next 700 days. Three scenarios were imposed: no action, lockdown, and new medicine. The implementation of the lockdown scenario was compared with the no-action and new medicine scenarios. This research found that lockdown intervention delays the peak point of the infection. The simulation prediction from the model showed that the highest infection cases would occur between 15 and 30 November 2020. The outbreak had been predicted to be under complete control after June 2021. The reproductive rate indicates that the lockdown and isolation of individuals still not be the best policy options to stop the spread of COVID-19. The study recommended that authorities implement a strict long-term prevention strategy as soon as possible to successfully reduce the size of the outbreak (Alanazi *et al*., 2020).

A time-dependent SIR model was employed to investigate the number of infected persons in China. The infected persons were classified into detectable and undetectable persons. Daily data was used between January 15, 2020 and March 2, 2020. The National Health Commission (NHC) of the People's Republic of China collected the dataset. The reproductive rate was greater than 1, which considered that

there was an outbreak. The reproductive numbers were reduced by adopting effective social distancing based on analysis of the independent cascade model, the so-called IC model for disease propagation in a configuration random network. The effectiveness of social distancing worked not just in China; this study found that it also worked in the case of Japan, Singapore, South Korea, Italy, and Iran (Chen *et al.*, 2020).

A discrete-time stochastic model using binomial distribution was developed to study the epidemic of COVID-19 in China. The study period was between January 11 and February 13, 2020 in China. Two main things were estimated to evaluate government policies implemented to control the transmission of the disease: The contact rate and effective reproductive numbers. Based on the current control policy option, the peak was predicted to be the end of February 2020 under the simulation technique generated from the model (He *et al.*, 2020).

Artificial Intelligence (AI) algorithms were incorporated into the SIR model with time-dependent parameters, and deep learning was applied to study the COVID-19 pandemic in South Korea. Datasets were collected from the Korea Centers for Disease Control and Prevention (KCDC). The critical parameters of the SIR model were estimated using the Runge-Kutta (RK4) method, a traditional numerical algorithm (Jo *et al.*, 2020).

The Susceptible-Exposed-Infectious-Removed (SEIR) model was applied with an AI approach to investigate the COVID-19 epidemic in China. Migration populations before and after January 23 were taken into account to measure and evaluate the effectiveness of policies employed, such as large-scale quarantine, strict controls on travel, and extensive monitoring of suspected cases. The highest number of infections might be in February 2020, as predicted by the model. The total number of infections would have increased threefold in mainland China if the government had taken inadequate policies and actions (Yang *et al.*, 2020).

A Markov Chain Monte Carlo technique and SEIR model were used to predict reproductive numbers caused by the COVID-19 pandemic in Italy and Hunan, China. Daily time-series data were applied from January 22, 2020, to April 2, 2020. As indicated by the posterior mean with 95 percent CrI, the reproductive number of COVID-19 was estimated to be 4.34 at 95 percent CrI in the range between 3.04 and 6.00, and 3.16 at 95 CrI in the range between 1.73 and 5.25, for Italy and Hunan, respectively. The endpoint in Italy was predicted to be on August 5, 2020 (Wangping *et al.*, 2020).

The SIR model was one of the best models for predicting the transmission of COVID-19 disease (Cooper *et al.*, 2020). A nonlinear SIR model was developed to study the COVID-19 epidemic in Germany, Spain, Italy, France, Algeria, and Morocco. The main objective of this research was to evaluate the social distancing

policy introduced by the government in each respected country. This research showed that the numerical simulation technique creates an effective tool for forecasting the transmission of COVID-19 disease (Gounane *et al.*, 2021).

SEIR model was extended to be susceptible (S), exposed (E), infectious (I), quarantined (Q), recovered (R), deaths (D), and vaccinated (V) (SEIQRDV) to investigate the spread of COVID-19 disease in KSA by taking into account vaccination compartment. The ensemble Kalman filter (EnKF) method was used to improve the efficiency of parameter estimation. In a short-term prediction, two weeks ahead, the level of recovered, deaths, and confirmed cases were simulated from the model, and the prediction error was a minor deviation compared to accurate data. The pandemic was being affected by vaccination, as revealed by this research (Ghostine *et al.*, 2021). The analysis of the COVID-19 pandemic was started with a basic epidemical model developed by Kermack-McKendrick. The model was extended to observe the heterogeneity in the spread of the disease, especially to study the effectiveness of policy options that any government might have used to control the pandemic, such as non-pharmaceutical interventions, lockdown strategy, potential approaching of herd-immunity levels, and optimal deploying of COVID-19 vaccines. This research was theoretical (Saldana & Velasco-Hernandez, 2021).

SEIR model was extended by including the asymptomatic isolated, in short, it was called SEIR-AQ, to conduct performance measurement prevention and control strategies for the COVID-19 pandemic in China, America, India, and Brazil. Instead of dividing the population into four: Susceptible people (S), Exposed (E), Infected (I), and Removed (R), the SEIR-AQ included four more in the model, such as isolation of susceptible people (Sq), isolation of contacts (Eq), isolation of infected people (Iq), asymptomatic patients (A), and hospitalized patients (H). The parameters of the model were calculated using the Euler method. The transmission of COVID-19 disease was affected significantly through the effective implementation of isolation and medical tracking isolation regarding the theoretical analysis. Studies have shown that in containing the spread of the COVID-19 pandemic, the local government's swift precaution and control measures are vital to minimize direct contact among people to reduce the exposure rate and ensure proper isolation rate (Yu *et al.*, 2021).

The literature review shows studies measuring the COVID-19 pandemic in different countries and the policy options for the government to prevent and control infections. In the presence of quite a limited number of studies, this chapter aims to significantly contribute to the current discussion and measures to control the pandemic in the Kingdom of Cambodia.

3. METHODOLOGY

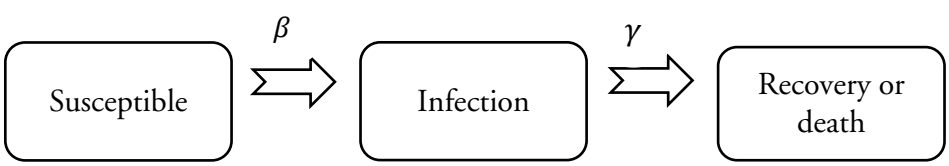
The methodology part of this chapter is divided into two parts: The first part describes the Susceptible-Infected-Recovery model, known as SIR model, which is developed aiming to determine the maximum number of infective of COVID-19 and when this number is going to happen, while the second part of the methodology represents a multiple regression between dependent variable, total infected COVID-19 cases, and the independent variables indicate policy options, which have been carried out by the government in order to fight with the infection. The SIR model is one of the epidemiologic models to understand the spread of an infectious disease. There are three observed variables: Susceptible (S), infected (I), and recovery (R), which means the total population is classified into three components. The model specification is presented in the following three equations:

$$\frac{dS}{dt} = -\beta SI$$

$$\frac{dI}{dt} = \beta SI - \gamma I$$

$$\frac{dR}{dt} = \gamma I$$

Where β is the probability of infecting a contact in a specified time, and$\gamma$is the rate at which an infected recovers and moves into the resistance phase. This model had three key assumptions. The first assumption is that individuals are never infected and can catch the disease. The second compartment is that infected individuals can spread the disease to susceptible individuals, and the third one is that individuals are assumed to be immune for life or death. The diagram shows these assumptions.



Solving the three differential equations above, we get:

Susceptible	*Infected*	*Recovered*
$dS = (-\beta SI)dt$	$dI = (\beta SI - \gamma I)dt$	$dR = \gamma I dt$
$S_{i+1} - S_i = (-\beta S_i I_i)dt$	$I_{i+1} - I_i = (\beta S_i I_i - \gamma I_i)dt$	$R_{i+1} - R_i = \gamma I_i dt$
$S_{i+1} = S_i - (-\beta S_i I_i)dt$	$I_{i+1} = I_i + (\beta S_i I_i - \gamma I_i)dt$	$R_{i+1} = R_i - \gamma I_i dt$

This research also tried to evaluate the performance of government policies that are being implemented to cope with the level of infection of the disease in the country. The assessment is carried out through a multiple regression analysis between total infected cases, *TC* (dependent variables), and independent variables, such as curfew (*CF*), lockdown (*LD*), vaccination (*PVCIN*), and stringency index (*SINDEX*) measured based on school and workplace closures; restrictions on public gatherings; transport restrictions; and stay-at-home requirements.

$$TC_t = \theta_1 CF_t + \theta_2 LD_t + \theta_3 PVCIN_t + \theta_4 SINDEX_t + \varepsilon_t$$

Where $\theta = [\theta_1, \theta_2, \theta_3, \theta_4]$is a vector of slope parameters to be estimated, ε is a residual or error term, and t represents the time. Curfew and lockdown represent dummy variables, where one indicates the days of the curfew or lockdown zero otherwise. The study period covers from February 20, 2021, to August 20, 2021. All data are collected from the Ministry of Health, Royal Government of Cambodia.

This research employs time series data; hence, to avoid spurious results, Unit root tests are conducted on all data series except dummy variables. The estimated method is Ordinary Least Square (OLS). In order to fulfill the assumptions of OLS, diagnostic tests, such as multicollinearity, autocorrelation, and heteroscedasticity, are carried out. The detection of multicollinearity is conducted through a correlation matrix. Any pair of variables with a correlation coefficient greater than -0.9/+0.9 is omitted from the regression analysis. The autocorrelation is detected using the Durbin-Watson statistic. The variance of the residual terms is assumed to be constant, so-called homoscedasticity, as indicated by OLS techniques. One of the most popular tests of heteroscedasticity is the Breusch-Pagan-Godfrey (BPG) test. The null hypothesis of the test is homoscedasticity.

4. EMPIRICAL RESULTS AND DISCUSSIONS

The interpretation of research findings is classified into three different parts. The first part concerns descriptive statistics on daily COVID-19 and total infected cases. The forecasting of daily susceptible, infected, and recovered or deceased is presented in the second part. The empirical results, which explain the effectiveness of government policies, curfew, lockdown, vaccination, and social distancing policies, on total COVID-19 infected cases, are shown in the last part of this section.

Throughout the study, 182 days, the average daily and total infected were 482 and 31,933 cases, respectively. The minimum daily infected case is zero, while the maximum infected cases are 1130. Daily new cases' standard deviation is 310, and the standard deviation of total cases is 29019. The maximum total number of infected cases is 88,242. In addition, the two data series are not distributed as normal

distributions regarding the estimated result of the Jarque-Bera (JB) tests. The probability of the tests for both NC and TC is lower than the level of significance of 1 percent, which claims that the null hypotheses are rejected. The movement of the two data series can be seen more precisely through Figure 5.1 and Figure 5.2.

Table 5.1: Daily New Infected Cases and Total Infected Cases

	New Infected Cases (NC)	*Total Infected Cases (TC)*
Mean	482.1868	31933.68
Median	549.0000	24401.00
Maximum	1130.000	88242.00
Minimum	0.000000	533.0000
Std. Dev.	310.1169	29019.29
Skewness	-0.204741	0.528999
Kurtosis	1.892583	1.882224
Jarque-Bera	10.57154	17.96325
Probability	0.005063	0.000126
Sum	87758.00	5811929.
Sum Sq. Dev.	17407216	1.52E+11
Observations	182	182

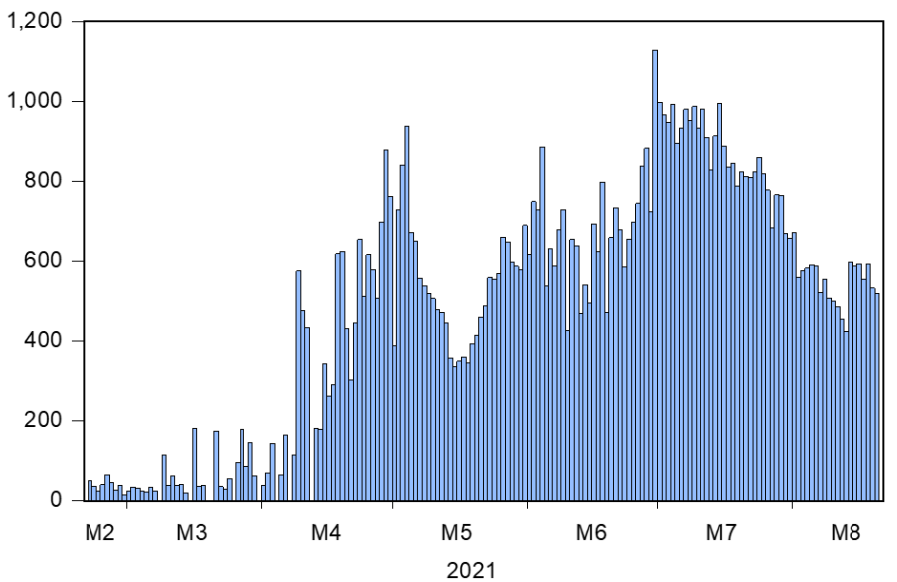


Figure 5.1: Daily Infected Cases, February 20, 2021 – August 20, 2021

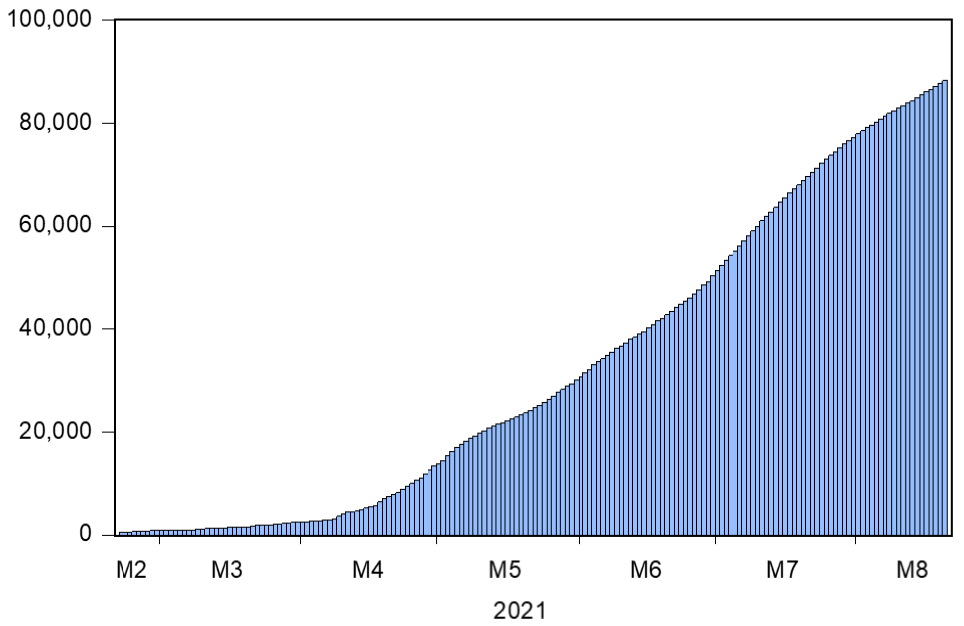


Figure 5.2: Total Infected Cases, February 20, 2021 – August 20, 2021

The observed time series data combined with the estimated probability infected infecting a contract in a specific time and the rate that an infected recovers and moves into the resistance phase, the out-of-sample forecasting of susceptible, infected, and recovered as a proportion to the total population in the country which derived from the Ordinary Differential Equation (ODE) are revealed. The simulation of the SIR model indicated that the infection of COVID-19 would be expected to peak on July 2, 2022, which is regarded as a turning point.

$\beta = 0.0461$ (Contact rate)
$\gamma = 0.0061$ (Recovery rate)

The data series used in this research are time series. The unit root tests are applied to avoid spurious results. One of the most famous unit root tests, the Augmented-Dickey Fuller (ADF) test, is selected to assess all the data series except the dummy variables, CF and LD. The null hypothesis of the test is that the series has a unit root. The result of the ADF tests presented in Table 5.2 indicated that TC, PVCIN, and SINDEX are all integrated of order one, I(1), which means that each individual series has a unit root at level but has no unit root at first difference. Therefore, a regression between dependent and independent variables can be performed at the level. However, a co-integration test must be conducted to check whether all data series are co-integrated or have a long-run relationship. Engle and

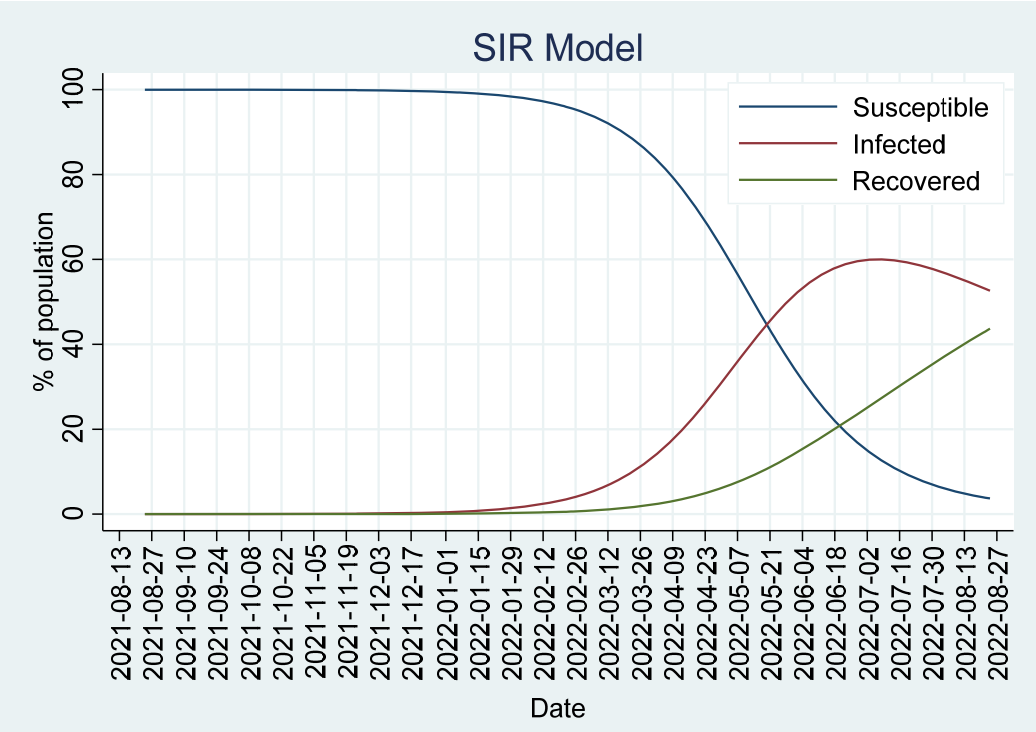


Figure 5.3: SIR Model, Out-of-Sample Forecasting

Granger's two-step co-integration test is applied. In the first step, a multiple regression is carried out to get all estimated parameters, which will be used to predict the residual terms. The co-integration among variables under investigation does exist if the residual series is stationary or has no unit root. Instead of avoiding spurious regression results, the fulfillment of the assumptions of OLS, no multicollinearity among dependent variables, no first-order autocorrelation of the residual terms, and variance of the error term must be constant, or homoscedasticity is also needed to investigate.

After analyzing the correlation between all independent variables in the model, a multiple regression analysis is implemented and presented in the correlation matrix below. As indicated in Table 5.3, the correlation coefficient of all pairs of variables is no less than -0.9 or no more than +0.9, which claims that high or perfectly positive or negative correlations between variables in the model are not detected. On the other hand, the multicollinearity in the model is not detected, which means that none of the variables is omitted.

Table 5.2: ADF Tests

	At Level			
		TC	***PVCIN***	***SINDEX***
With Constant	t-Statistic	4.1197	–0.5901	–1.1024
	Prob.	***0.4619***	***0.8686***	***0.7147***
		n0	n0	n0
With Constant and Trend	t-Statistic	–3.1581	–2.6122	–0.8219
	Prob.	***0.7964***	***0.2755***	***0.9608***
		n0	n0	n0
Without Constant and Trend	t-Statistic	7.6411	0.7694	–0.8095
	Prob.	***0.6285***	***0.8789***	***0.3641***
		n0	n0	n0
	At First Difference			
		d(TC)	d(PVCIN)	d(SINDEX)
With Constant	t-Statistic	–2.3383	–4.5358	–13.3725
	Prob.	***0.1612***	***0.0002***	***0.0000***
		n0	***	***
With Constant and Trend	t-Statistic	–3.4877	–4.5224	–13.6025
	Prob.	***0.0437***	***0.0018***	***0.0000***
		**	***	***
Without Constant and Trend	t-Statistic	–0.6388	–4.4568	–13.3791
	Prob.	***0.4394***	***0.0000***	***0.0000***
		n0	***	***

Note: ***, **, significant at 1% and 5% levels, respectively.

Table 5.3: Correlation Matrix

	CF	***LD***	***PVCIN***	***SINDEX***
CF	1			
LD	–0.1824	1		
PVCIN	–0.4766	0.1860	1	
SINDEX	–0.2347	0.1941	0.1322	1

As indicated by the ADF unit root test of the predicted residual series from the regression model, the null hypothesis, which stated that the residual series has a unit root, is highly rejected since the MacKinnon one-sided probability value or p-value is less than 1 percent significant level. The series is stationary. As such, all series in the model are co-integrated.

Table 5.4: ADF Unit Root Test, Residual Series

Null Hypothesis: RESID01 has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag =13)

			t-Statistic	*Prob.**
Augmented Dickey-Fuller test statistic			–5.861930	0.0000
Test critical values:	1% level		–3.466994	
	5% level		–2.877544	
	10% level		–2.575381	

*MacKinnon (1996) one-sided p-values

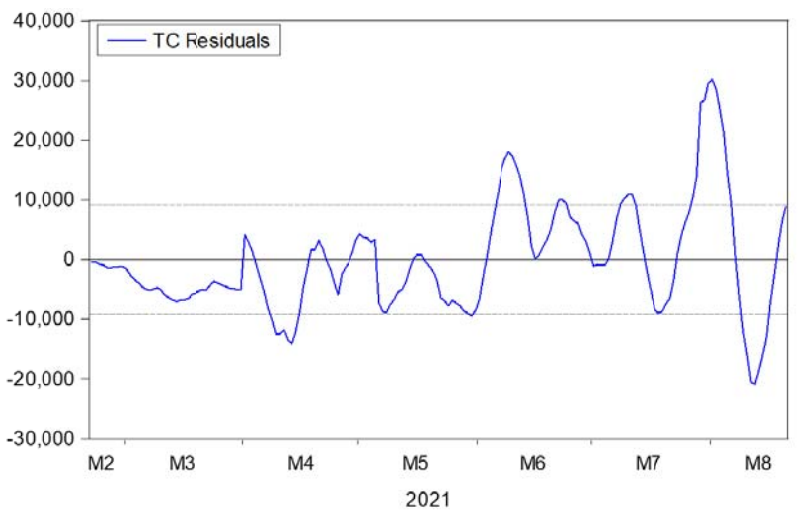


Figure 5.4: Regression Residual Series

The result of the ADF unit root test presented in Table 5.4 is consistent with the trend of the regression residual series in Figure 5.4, that the series has a mean-reverting process characteristic of a stationary process. The assessment of spurious regression results has been completed. The next issue is the detection of the first-order autocorrelation of the residual series. Since the Durbin-Watson statistic,

known as the d-statistic derived from the regression result, is 0.087, the difference between the two indicates that the first-order autocorrelation of the residual terms is detected. The next step is to check whether the variance of the error terms is constant or not using the Breusch-Pagan-Godfrey heteroscedasticity test. The null hypothesis of the test is homoscedasticity, which means that the variance of the residual terms is constant.

Table 5.5: Heteroscedasticity Test: Breusch-Pagan-Godfrey

F-statistic	24.36488	Prob. F (4,177)	0.0000
Obs*R-squared	64.62750	Prob. Chi-Square (4)	0.0000
Scaled explained SS	108.0612	Prob. Chi-Square (4)	0.0000

The calculated F-statistic of the Breusch-Pagan-Godfrey test is 24.36 based on 4 degrees of freedom and 177 observations, and since the probability of the calculated F-statistic is 0.0000, which is far less than 1 percent significant level, the null hypothesis of homoscedasticity is rejected, which claimed that heteroscedasticity does exist.

Table 5.6: Regression Results

Dependent Variable: TC

Method: Least Squares

Sample: 2/20/2021 - 8/20/2021

Included observations: 182

HAC standard errors and covariance (Bartlett kernel, Newey-West fixed bandwidth = 5.0000)

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
CF	–9286.751	5260.985	–1.765211	0.0792
LD	–10362.02	1918.662	–5.400651	0.0000
PVCIN	–6.668291	0.350045	–19.04981	0.0000
SINDEX	–6.700497	29.69047	–0.225678	0.8217
R-squared	0.902006	Mean dependent var		31933.68
Adjusted R-squared	0.900354	S.D. dependent var		29019.29
S.E. of regression	9160.432	Akaike info criterion		21.10491
Sum squared residual	1.49E+10	Schwarz criterion		21.17533
Log likelihood	–1916.547	Hannan-Quinn criterion		21.13345
Durbin-Watson stat	0.087266			

Two assumptions of OLS were found to be violated: First-order autocorrelation and heteroscedasticity. Due to these violations, the test of statistic generated from the regression results is unreliable since each individual standard error of the t-statistic is significant, which turn out that the calculated t-test is small. In order to remedy first-order autocorrelation and heteroscedasticity problems, heteroscedasticity and autocorrelation consistent (HAC) standard error and covariance are employed to produce robust standard errors for hypotheses testing. The regression result is presented in Table 5.6. The adjusted R-squared is 0.90, which is considered high, meaning the model fits the data well. The estimated slope parameter of CF is -9286, and the null hypothesis that the population parameter of CF is zero is weakly rejected since the p-value is 0.0792, which is less than a 10 percent significant level. A one-day curfew is expected to reduce the number of infected cases by 9286. More interestingly, the estimated slope coefficient of LD is -10362 and highly statistically significant at a 1 percent level, which is greater than the p-value of 0.0000. The number of infected cases would reduce by 10362 if the government announced a lockdown by one day. The number of vaccinated people has also helped reduce the spread of the disease. A one-vaccinated person would help prevent the infection of the disease by about seven people, and the estimated result is highly significant at the 1 percent level since the probability of the calculated t-test is low. Despite the estimated slope coefficient of SINDEX being -6.700497, which is negative, the null hypothesis failed to be rejected because the p-value of 0.8217 is greater than the significance level of 5 percent.

5. CONCLUDING REMARKS

This research aims to study the interaction between susceptible, infected and recovered COVID-19 using the Ordinary Differential Equation to conduct the out-of-sample forecast. Another objective is to assess government policies in fighting the spread of the disease nationwide. Regarding the estimated contracted rate and the recovery rate, which were 0.0461 and 0.0061, respectively, the simulation of the SIR model indicated that the total infected COVID-19 cases were predicted to reach the peak point that is regarded as a turning point on July 2, 2022. From August 20, 2021, the present time or end of the sample data point of this study, to July 2, 2022, which was predicted to be a peak point of the total infected cases as proportion to the total population, which has about ten months and a half for the government to establish effective policies, such as curfew, lockdown, vaccination, and social distancing policy in order to cope with COVID-19 pandemic. Among the four policies employed, lockdown is considered to be one of the most effective strategies to fight the pandemic since a one-day lockdown is expected to decrease the total infected cases by 10362, followed by curfew, which helped reduce the spread of the disease by about 9287 cases per day. In contrast, the last policy is vaccination, which

prevented the infection by about seven cases per day. Of course, executing government policies, especially lockdowns and curfews, would help prevent the spread of the disease. However, it harmed the economy, and therefore, it needs to be carefully implemented prudently by the government and its agencies.

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CHAPTER 6

Business Disruptions from Social Distancing[1]

Miklós Koren and Rita Pető

1. INTRODUCTION

Social distancing measures are effective non-pharmaceutical interventions against the rapid spread of epidemics (Bootsma & Ferguson, 2007; Markel *et al.*, 2007; Hatchett *et al.*, 2007; Wilder-Smith & Freedman, 2020). Many countries have implemented measures, such as school closures, prohibition of large gatherings, and restrictions on non-essential stores and transportation to slow down the spread of the 2019–20 coronavirus pandemic (Anderson *et al.*, 2020; Cohen & Kupferschmidt, 2020; Thompson & Serkez, 2020; "Mayor de Blasio Issues New Guidance to New Yorkers," 2020). What are the economic effects of such social distancing interventions? Which businesses are most affected by the restrictions?

Past research has analyzed the efficacy of social distancing interventions in reducing the spread of epidemics using the 1918 Spanish Flu in the U.S. (Hatchett *et al.*, 2007; Markel *et al.*, 2007; Bootsma & Ferguson, 2007) and seasonal viral infections in France (Adda, 2016). However, our knowledge of economic impacts is limited (Wren-Lewis, 2020). For this question, past data may be less relevant, as the importance of face-to-face communication has increased steadily in the last 100 years through urbanization (Henderson, 2010, 2002) and specialization increased in business services as well (Herrendorf *et al.*, 2014; Duarte & Restuccia, 2019). Even if advances in information and communication technology have made it increasingly possible to communicate with co-workers and customers without physical face-to-face interactions, personal contact is still inevitable in some industries (Dingel & Neiman, 2020; Von Gaudecker *et al.*, 2020).

The starting point of this paper is the observation that many sectors rely heavily on face-to-face communication in the production process (Charlot & Duranton, 2004; Tian, 2019). We build a model of communication to understand how limiting face-to-face interaction increases production costs. Without social distancing, workers specialize in a narrow range of tasks and interact with other workers, completing other tasks. This division of labor reduces production costs but requires frequent contact between workers. In the model, the number of contacts per worker is the

most frequent in businesses where the division of labor is important. When face-to-face interaction is limited, these are precisely the businesses that suffer the most.

To measure business disruptions from social distancing, we turn to recent data on the task descriptions of each occupation (National Center for O*NET Development, 2020), the precise geographic location of non-farm businesses in the U.S. (U.S. Bureau of the Census, 2017), and customer mobility patterns (SafeGraph, 2020). We construct three groups of occupations. First, some occupations require face-to-face communication several times a week with other workers. Examples of these *teamwork-intensive* occupations include maintenance, personal-care related occupations, and health care professionals. Other occupations require frequent face-to-face contact with customers. Retail salespersons, social workers, waiters and waitresses are examples of such *customer-facing* occupations. The third group of workers may need to be in proximity of one another even if they do not communicate, for example, to operate machinery or access key resources. Such occupations requiring physical presence include drivers and machine operators, especially in mining and water transport, where crammed working environments are shared. With our occupation level measures, we aim to capture the jobs that can be performed less efficiently from home. We validate our indexes using the American Time Use Survey (ATUS) (U.S. Bureau of Labor Statistics, 2018), which directly asks about the possibility of working from home.

To study how the patterns of interaction have changed in the U.S. during the COVID-19 pandemic, we use customer mobility data from SafeGraph (SafeGraph, 2020). This dataset measures the number of visits to a business in a given month, as captured from several cell phone apps and made available to researchers in an anonymized form. We study how the reduced number of customer visits is correlated with changes in sectoral employment.

2. A MODEL OF COMMUNICATION

When workers communicate with others, they can divide labor more effectively. Production involves sequentially completing tasks indexed by $z \in [0,1]$. A single worker can do a range of tasks, but there is a benefit to specialization and division of labor (Smith, 1778; Becker & Murphy, 1992). The labor cost of a worker completing $Z < 1$ measure of tasks is $Z^{1+\gamma}/\gamma$, where $\gamma > 0$ captures the benefits of the division of labor. As shown below, the higher the γ, the more specialized each worker will be in a narrower set of tasks. Without loss of generality, we normalize the wage rate of workers to one so that all costs are expressed relative to worker wages.

Once the range of tasks Z is completed, the worker passes the unfinished product on to another worker. This has a cost of τ, which can capture the cost of

communicating and interacting across workers. After all the tasks are completed, another step of communication with cost τ is needed to deliver the product to the customer. This cost leads to the Marshallian externality that firms want to be close to their customers and customers want to be close to their suppliers (Marshall, 1920; Krugman, 1991).

The firm will optimally decide how to share tasks between workers. The key trade-off is economizing on the cost of communication while exploiting the division of labor (Becker & Murphy, 1992). Let n denote the number of workers involved in the production process. Because workers are symmetric, each works on $Z = 1/n$ range of tasks before passing the work to the next worker. Production involves $n - 1$ "contacts" (instances of communication), and there is an additional contact with the customer.

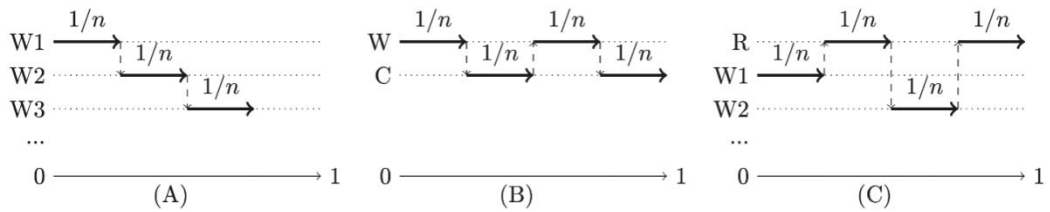

Figure 6.1: Patterns of Interaction in the Workplace

Notes: Horizontal movement represents production; vertical movement represents interaction

(a) Each worker w works on a range $1/n$ of tasks, passing work $n - 1$ times
(b) Worker w and customer c engage in frequent interactions
(c) Each worker W needs physical access to a key resource R

Figure 6.1 illustrates the division of labor between workers. The horizontal movement represents production along a range of tasks ($Z = 1/n$), and the vertical movement represents interaction (τ). We note three potential interpretations of our model. First, workers working in teams can efficiently divide labor among themselves (panel A). The benefit of a larger team is better specialization. Law firms, management teams, and IT service firms are prime examples of businesses where intensive communication leads to narrow specialization (Garicano & Hubbard, 2009). Second, communication may involve the customer (panel B). The benefit of more frequent interaction with the customer is a product or service that is better suited to their needs. Restaurants, beauty salons, and personal and social services require frequent interaction because their service is customized. Third, workers may need access to a critical physical resource (panel C). In this case, even if they do not communicate, they may be subject to social distancing measures. For example, operators of machines, vehicle drivers, or workers on an oil rig are all very much tied to a key resource to do their job. The fundamental assumption behind all three interpretations is that frequent

interaction increases productivity, whether happening between workers, workers and customers, or between workers and machines.

The firm's cost minimization problem can then be written as a function of the number of contacts alone,

$$c(\tau) = \min_{n} n\tau + \frac{1}{\gamma} n^{-\gamma}, \quad \ldots (1)$$

where total communication costs are $n\tau$, and production costs are $nZ^{1+\gamma}/\gamma$ with $Z = 1/n$.

Given the strict convexity of this cost function and ignoring integer problems, the first-order condition is necessary and sufficient for the optimum,

$$n^*(\tau) = \tau^{-1/(1+\gamma)}. \quad \ldots (2)$$

The number of worker contacts is decreasing in the cost of communication, expressed relative to worker wage. When the division of labor is essential, γ is high, and the number of contacts does not depend very strongly on communication costs.

The total cost of producing one good can be calculated by substituting (2) into (1),

$$c(\tau) = \tau^{\chi}/\chi, \quad \ldots (3)$$

where $\chi = \gamma/(1 + \gamma) \in (0, 1)$ measures the importance of division of labor. This unit cost function is the same as if workers and communication were substitutable in the production function in a Cobb-Douglas fashion. Indeed, χ captures the share of costs associated with communication and can be calibrated accordingly.

2.1 Social Distancing

We study the effect of social distancing, which reduces the number of face-to-face contacts to some exogenous value *N*. This may be mandated by government orders to close certain places of business or stay at home. However, it can also result from voluntary social distancing in response to the risk of infection.

The optimal number of contacts without social distancing is given by Eq (2). Firms with $n^* > N$ are limited by social distancing. Their unit cost will increase to $c' = N\tau + N^{-\gamma}/\gamma$, which is greater than the optimal cost,

$$\frac{c'}{c} = \chi \frac{N}{n^*} + (1 - \chi)\left(\frac{N}{n^*}\right)^{-\gamma} > 1. \quad \ldots (4)$$

The first term of the weighted average is less than one, representing a reduction in communication costs once the number of contacts declines. The second term is greater than one because every worker has to complete a broader range of tasks than before, and they lose the benefit of specialization. Because n^* is the cost-minimizing

communication choice of the firm, the second term dominates, and production costs increase with social distancing.

3. DATA AND METHODOLOGY

To estimate the potential disruptions from social distancing, we need a measure of the importance of worker interaction (corresponding to χ in the model) and its change (captured by the ratio N/n^*).

Let ξ_o denote an indicator equal to one if occupation o is interaction-intensive and zero otherwise. For industry, i, $\chi_i = \sum_o s_{io}\,\xi_o$ measures the fraction of workers in affected occupations, with s_{io} denoting the employment share of occupation o in industry i.

We use the Occupational Information Network (O*NET) (National Center for O*NET Development, 2020) to measure the characteristics of a given occupation, similar to previous studies (Firpo *et al.*, 2011; Autor & Dorn, 2013; Jin & McGill, 2020; Dingel & Neiman, 2020; Leibovici *et al.*, 2020; Mongey & Weinberg, 2020). The O*NET dataset contains detailed standardized descriptions of almost 1,000 occupations along eight dimensions. We focus on job characteristics related to recent social distancing measures, while prior work focused mainly on measuring the offshorability of the given tasks (Firpo *et al.*, 2011; Autor & Dorn, 2013).

Social distancing interventions limit the interaction between people and regulate physical proximity between individuals. We thus focus on three related job characteristics based on work context and work activity described in O*NET. The first two indicators capture how communication-intensive the job is. Communication can be of two types: internal communication with co-workers (*teamwork*) or external communication directly with customers (*customer-facing*). The third indicator considers the possibility that workers may need to be in proximity to one another even if they do not communicate. We create an index that shows how significant *physical presence* is to perform a given job. Table 6.1 details the specific O*NET indexes contributing to our three measures. As social distancing measures only limit personal communication, for communication indexes, we require that the necessary face-to-face communication happens at least several times a week. Face-to-face meetings can often be substituted by more structured communication, for which working from home is less disruptive. To allow for this possibility, we only classify occupations as teamwork-intensive or customer-facing, where emails, letters and memos are less frequent forms of communication than face-to-face meetings. This excludes most managers and certain business services. Similarly, for physical presence, we require at least a certain degree of proximity to other workers, corresponding to working in a shared office.

Table 6.1: Definition of Social Distancing Indexes

Index	*Tasks*	*Context*
Teamwork	Work with a Work Group or Team	Face-to-face discussions several times a week more often than emails, letters, memos
	Provide Consultation and Advice to Others	
	Coordinating the Work and Activities of Others	
	Guiding, Directing, and Motivating Subordinates	
	Developing and Building Teams	
Customer	Deal with External Customers	Face-to-face discussions several times a week more often than emails, letters, memos
	Performing for or Working Directly with the Public	
	Assisting and Caring for Others	
	Provide Consultation and Advice to Others	
	Establishing and Maintaining Interpersonal Relationships	
Presence	Handling and Moving Objects	Density of co-workers, like a shared office or more
	Operating Vehicles, Mechanized Devices or Equipment	
	Repairing and Maintaining Electronic Equipment	
	Repairing and Maintaining Mechanical Equipment	
	Inspecting Equipment, Structures, or Material	

Note: Each social distancing index (column 1) is created as an arithmetic average of the component indexes (column 2). To be classified as an affected occupation, the average has to exceed 62.5, and the work context index has to exceed the threshold in column 3.

We aggregate the measures into 6-digit occupation codes (Standard Occupational Classification; 2010-SOC). We have information on the relevance of teamwork, customer contact, and physical presence for 809 occupations in SOC 2010 codes.

Teamwork and customer contacts are highly correlated (Figure 6.2) but are conceptually different. While all medical occupations require teamwork and customer contact, supervisors generally work in teams but only sometimes communicate directly with customers. In general, machine operators and production workers are at the bottom of both distributions. As managers can substitute personal communication

with emails, they are not considered in general as teamwork-intensive occupations according to our definition. Given the high correlation between the two types of communication, we often refer to *communication-intensive* occupations that are either teamwork-intensive or customer-facing.

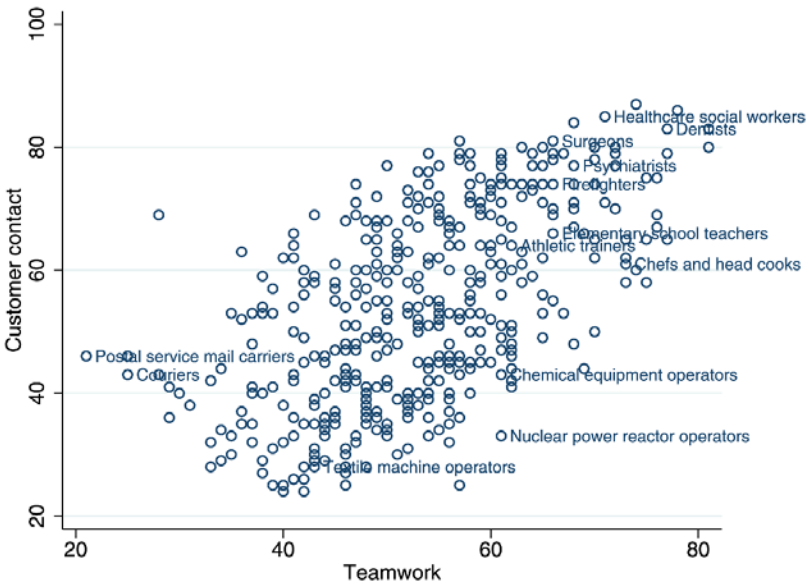

Figure 6.2: Teamwork and Customer Contact are Highly Correlated

Note: Each circle represents an occupation. Teamwork and customer contact indexes are constructed as explained in the main text.

Our occupation-level measures aim to capture the type of activities that require frequent face-to-face contact. We assume that these activities cannot be effectively done from home. To validate this assumption, we use data from the American Time Use Survey (ATUS) (U.S. Bureau of Labor Statistics, 2018), which asks workers whether they *can* work from home. Figure 6.3 plots our customer-intensity measure for each occupation against the share of workers who reported in ATUS that they can work from home (dark-filled circles). Indeed, most customer-facing occupations have few workers who could work from home. The pattern is different if we look at occupations that rely more on email, letters, and memos for customer communication (light hollow circles). The majority of these workers can work from home. Interestingly, for each degree of working from home (horizontal axis), there is sufficient variation in the importance of customer contact (vertical axis). The same patterns can be observed for teamwork-intensive occupations (Figure 6.4). This makes us conclude that dropping occupations primarily relying on email, letters, and memos is sufficient to control the potential to work from home.

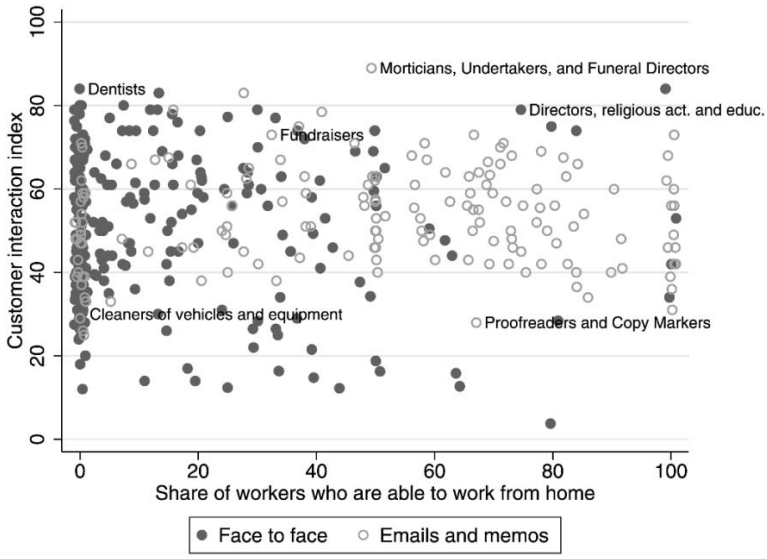

Figure 6.3: Workers in Customer-facing Occupations with Face-to-face Interaction can Rarely Work from Home

Note: Filled circles represent the occupations where face-to-face contacts are more critical than emails and memos. Hollow circles represent the occupations where emails and memos are more important than face-to-face contacts. The indexes are constructed as explained in the main text.

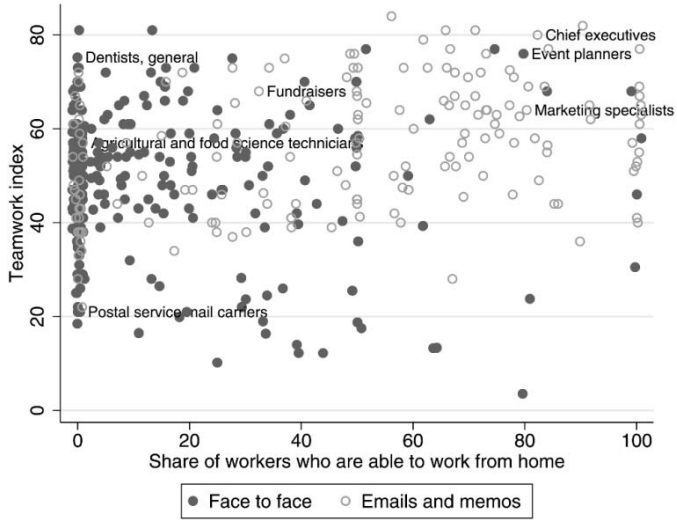

Figure 6.4: Workers in Teamwork-Intensive Occupations with Face-to-Face Interaction can Rarely Work from Home

Note: Filled circles represent the occupations where face-to-face contacts are more important than emails and memos. Hollow circles represent the occupations where emails and memos are more important than face-to-face contacts. The indexes are constructed as explained in the main text.

With our validated occupation measures in hand, our next step is to calculate the share of workers for each sector whose job requires a high level of teamwork, customer contact, and physical presence. We use the same sectoral breakdown as the Current Employment Statistics (CES) (U.S. Bureau of Labor Statistics, 2020a). As all the indexes are an absolute value running from 0 to 100, we use 62.5 as a cutoff to define a job as teamwork-intensive, customer contact-intensive, or a job that requires physical presence from the worker. The occupation structure of the industries is retrieved from the official industry-occupation matrix (U.S. Bureau of Labor Statistics, 2020b); we use the employment statistics by occupation-industry for February 2020.

Based on the share of relevant occupations in industry employment, the most teamwork-intensive sectors are, for example, "Hospitals," "Accommodation," and "Motion picture and sound recording industries." In contrast, teamwork is unimportant in sectors like "Forestry and logging" and "Fishing, hunting, and trapping." Customer contact is relevant in sectors like "Hospitals" and "Retail," while it is not relevant in sectors like "Truck transportation," and "Forestry and logging." Physical presence is relevant in sectors like "Truck transportation," "Repair and maintenance," and mining in general, but not in finance and information technology.

"Hospitals" score high on all three measures because communication in health care teams and with patients is essential, and doctors and nurses work in close physical proximity to others. Nonetheless, we remove this sector from the analysis because of its inevitable direct role in combating the epidemic, which is not captured well in a simple communication model.

To measure how the number of interactions has changed due to social distancing, we use data from SafeGraph (SafeGraph, 2020). This data company aggregates anonymized location data from numerous applications to provide insights about physical places. To enhance privacy, SafeGraph excludes census block group information if fewer than five devices visited an establishment in a month from a given census block group.

We use the Monthly Patterns file that captures the number of visits by mobile devices in the sample to more than 4 million points of interest (POIs) each month. Each POI is assigned a specific address, including a ZIP code, and a 6-digit NAICS code. Because the pandemic hit different regions of the U.S. at different times, we use both the industry and the regional variation of customer mobility data. We aggregate monthly visits by 3-digit NAICS code and ZIP code. This enables us to measure how much, for example, visits to clothing stores have declined in downtown Manhattan.

We measure the percentage change in the number of visits between February and May 2020. When the industry-ZIP cell receives fewer than ten visits in either month

or visit data is missing in SafeGraph; we replace the change in visits with the ZIP code's average.

To validate the customer mobility data, we check the location of sectors in the County Business Patterns (CBP) data for 2017 (U.S. Bureau of the Census, 2017). We use the data tabulated by ZIP-Code Tabulation Areas for a finer spatial resolution. The CBP lists the number of establishments of a certain size for each ZIPcode and NAICS industry code. We estimate the employment of each industry in each ZIP code to be able to compute employment-weighted national averages of our statistics of interest.

Because establishment sizes are given in bins (e.g., 1–4 employees), we take the midpoint of each bin as our estimated employment (e.g., 2.5 employees). In small industries and ZIP codes, the Census omits some size categories to protect the confidentiality of businesses. We impute employment in these plants from the national size distribution of plants in the same NAICS industry. Our estimated industry-level employment is a very good approximation to official employment statistics (U.S. Bureau of Labor Statistics, 2020a). The correlation between our estimates based on CBP and the employment reported in CES is 0.98.

4. COUNTERFACTUAL CALCULATIONS

To gauge the magnitude of the effect of social distancing, we compute the effect of the decline in the number of customer-worker contacts. At the same time, we let the government introduce a proportional wage subsidy λ to help offset the costs from lower interaction. With this subsidy, the cost of labor will be $(1-\lambda)$.

We ask what level of λ would compensate businesses for the communication disruption caused by social distancing. When interactions decrease, $N < n^*$, production costs increase. We compute the subsidy λ, which would offset the cost increase when given to every worker. This way, the business would not have to fire any of its workers. The goal of this exercise is not to evaluate any particular employment support policy but to get a sense of the magnitude of business disruptions.

Using the cost change in Equation 4, we can express the compensating labor subsidy of industry i in region r as

$$\lambda_{ir} = 1 - \frac{1-\chi_i}{1-\chi_i N_{ir}/n^*_{ir}} \left(\frac{N_{ir}}{n^*_{ir}}\right)^{\gamma_i} > 0. \quad \ldots (5)$$

We calibrate n^*_{ir} to match the number of customer visits to establishments of industry i in ZIP-code r in February 2020, assuming that these visits were optimal before the pandemic hit the U.S. The new number of visits, N_{it}, will be calibrated to the number of customer visits in May 2020. The compensating wage subsidy increases

the importance of communication χ_i and decreases the change in contacts N_{ir}/n^*_{ir}. The subscripts note that communication sharing is industry-specific, and the change in contacts is both industry-and region-specific.

To calibrate the importance of communication χ_i, note that it is the cost share of communication and can be correspondingly calibrated to the employment share of communication-intensive occupations in the industry i. We then compute the compensating wage subsidy for each industry in each ZIP code using Equation 5. We report employment-weighted averages of this across sectors and locations.

5. RESULTS

Table 6.2 displays the top five and the bottom five industries by 2-digit NAICS industries as sorted by the percentage of workers in communication-intensive occupations, excluding hospitals and clinics. Across industries, retail trade and accommodation and food services, arts, entertainment, and recreation have the highest share of communication-intensive workers, exceeding 35 percent. Information, transportation, production, professional, scientific, technical services, and agricultural industries rely less on face-to-face communication. This heterogeneity across industries is important to understand the effect of social distancing measures.

Table 6.2: Retail, Accommodation, and Restaurants are the Most Communication Intensive

Industry	*Communication*			
	Teamwork	*Customer*	*Overall*	*Presence*
Retail trade	13	66	67	5
Accommodation & food services	8	50	51	1
Arts, Entertainment, and Recreation	12	38	40	2
Other Services (except Public Admin.)	12	30	33	12
Admin. & Support & Waste Manag.	17	24	27	7
Wholesale Trade	8	12	15	12
Transportation and Warehousing	8	8	14	32
Prof., Scient., and Technical Serv.	5	10	12	1
Manufacturing	7	5	9	10
Agri., forestry, fishing & hunting	4	1	4	23

Note: "Teamwork" and "Customer" show the percentage of workers in teamwork-intensive and customer-facing occupations, respectively. "Overall" shows the percentage of workers in communication-intensive occupations that are either teamwork-intensive or customer-facing. It is less than the sum of the two indexes because some occupations rely on both types of communication. "Presence" shows the percentage of workers whose jobs require physical presence in close proximity to others.

Table 6.3 reports the regression results of the log change in industry employment between February and May 2020 on our social distancing indexes. Each regression is estimated with unweighted ordinary least squares. Across the entire non-farm economy, employment has dropped by 13 percent (not seasonally adjusted) (U.S. Bureau of Labor Statistics, 2020a).

Table 6.3: Employment Decline was Sharpest in Customer-facing Industries

	(1)	*(2)*	*(3)*
Customer-facing workers (share, [0, 1])	–0.418***	–0.463***	0.012
	(0.164)	(0.152)	(0.173)
Teamwork-intensive workers (share, [0, 1])	0.024	0.254	0.600
	(0.563)	(0.532)	(0.839)
Presence-intensive workers (share, [0, 1])	0.079	–0.051	–0.005
	(0.125)	(0.136)	(0.113)
Change in number of monthly visits (log)		0.185***	–0.119
		(0.063)	(0.131)
× customer-facing share ([0, 1])			1.021**
			(0.447)
× teamwork-intensive share ([0, 1])			0.332
			(1.500)
Observations	79	78	78
R^2	0.187	0.302	0.435

Note: Regression results of change in log industry employment between February and May 2020 estimated by ordinary least squares (unweighted). Explanatory variables in Column 1 are the shares of customer-facing, teamwork-intensive, and presence-requiring workers. Column 2 controls for the change in log monthly visits to industry establishments. Column 3 interacts the change in visits with the share of face-to-face intensive workers in the two occupation groups. Robust standard errors are reported in parentheses. p-values are denoted by asterisk: * < .1 ** < .05 *** < .01. Sample excludes hospitals, clinics, and government establishments, as well as farming and fishing, which are not present in CBP.

As Column 1 shows, the drop was larger in industries with a larger share of customer-facing workers. There is no significant correlation between the share of workers with teamwork-intensive jobs or the share of workers requiring physical presence to do their work and employment losses. In Column 2, we control for the change in log customer visits. Indeed, changes in customer visits are positively correlated with changes in employment (both dropping for most of our industries). In Column 3, we introduce interactions with the change in log customer visits (as a

proxy for $\ln(N/n^*)$) and the share of communication workers (as a proxy for χ). As predicted by the model, the drop in customer visits has the most significant effect on sectoral employment in sectors where the share of customer-facing workers is highest.

As we see from the regression results above, the largest decline in sectoral employment is in sectors with the highest share of customer-facing workers. Hence, we use the share of customer-facing workers for the following analysis.

In the calibrated model, the social distancing that took place between February and May 2020 would be compensated by a 39.9 percent wage subsidy. However, the compensating wage subsidy distribution is unequal across industries. Retail trade, where customer visits practically ground to a halt, would require a 234 percent wage subsidy. Retail trade, where customer visits practically ground to a halt, would require a 234 percent wage subsidy. By contrast, the compensating wage subsidy in agriculture, transportation, and manufacturing would be less than 2 percent (Table 6.4).

Table 6.4: The Five Most Affected Sectors Require More than 14 Percent Wage Subsidy

Industry	*Wage subsidy*	*Employment*
Retail Trade	234	15,672
Arts, Entertainment, and Recreation	30.2	2,472
Accommodation and Food Services	26.1	14,394
Educational Services	22.2	3,828
Other Services (except Public Admin.)	14.5	5,941
Wholesale Trade	1.8	5,934
Construction	1.1	7,639
Manufacturing	1.1	12,852
Management of Companies and Enterprises	1.1	2,447
Agriculture, Forestry, Fishing and Hunting	0.5	55
Average	39.9	116,441

Note: "Wage subsidy" displays the percentage decrease in labor costs necessary to compensate businesses for the reduced number of customer-worker contacts. "Employment" is the February 2020 employment of the sector in thousands (U.S. Bureau of Labor Statistics, 2020a). The last row shows the employment-weighted average wage subsidy. The table excludes hospitals, clinics, and government establishments not present in CBP.

6. DISCUSSION AND CONCLUSIONS

The main cost of social distancing in our model is insufficient division of labor. This mechanism is motivated by (Smith, 1778) and captures the same trade-off as (Becker & Murphy, 1992). Our contribution is specifying the cost function to map it to the data easily.

More broadly, we argue that frequent interaction increases productivity, whether between workers, between workers and customers, or between workers and machines. In the central part of the empirical analysis, we focused only on the first two types of interactions, while we were silent about the third. However, social distancing measures also affect sectors where workers need to be in proximity to one another even if they do not communicate, for example, to operate machinery or access critical resources. This is relevant in sectors like "Mining, Quarrying, and Oil and Gas Extraction" and "Transportation." At the same time, it is irrelevant in sectors like "Finance and Insurance" and "Professional, Scientific, and Technical Services."

To a greater or lesser extent, all sectors are affected by social distancing. The intervention hits some sectors due to restricted face-to-face communication; others are hit due to restricted physical proximity of people. Some sectors are less affected across all dimensions. Examples include "Fishing, hunting and trapping," "Printing and related support activities," and manufacturing in general.

Our results are consistent with parallel research on the overall economic effects of the coronavirus pandemic using O*NET data. Recent research found about 34 percent of U.S. jobs can be performed from home (Dingel & Neiman, 2020). However, as our analysis points out, even among jobs that do not fall into this category, some are more at risk from social distancing than others. The share of workers working in close physical proximity to other people is similar to other recent estimates (Leibovici *et al.*, 2020). Workers in this group are found to be the most vulnerable across a wide range of socio-economic measures (Jin & McGill, 2020; Mongey & Weinberg, 2020). We contribute to this work by (i) building a model to understand how social distancing measures affect production, (ii) identifying three groups of occupations affected by social distancing, and (iii) validating our model with customer visit and employment data.

We see three avenues for further research. The first concerns the interaction between sectors and regions. Whenever productivity in any business drops, this shock can propagate to its buyers and suppliers. The epidemic's aggregate consequences will be modulated by input-output linkages between sectors, regions, and countries (Caliendo *et al.*, 2014; Caselli *et al.*, 2020; Baldwin & Tomiura, 2020; Barrot *et al.*, 2020).

The second and third directions concern the long-run response of businesses as they try to become more resilient to such shocks in the future. Whether the share of telecommunication remains large in the long run depends crucially on how easily it substitutes for face-to-face interaction. Previous work has found face-to-face communication more effective in high-intensity communication, particularly in overcoming incentive problems in joint production (Gaspar & Glaeser, 1998; Storper & Venables, 2004). Data on internet flows suggests that telecommunication

is not a good substitute for face-to-face meetings (Cuberes, 2013). None of these papers discuss disruptions from social distancing measures.

Third, businesses may change location in response to perceived threats and disruptions. Epidemics have a disproportionate effect on cities. So, in a post-pandemic spatial equilibrium (not modeled here, but see Tian, 2019), the agglomeration premium falls, and firms find it less attractive to locate in cities. A poignant point of comparison is the increased threat of terrorism in major cities following devastating attacks on New York, Washington, London, Paris, Madrid, Moscow, and Mumbai. The general conclusion about terror threats is that cities have remained resilient and a robust attractor of businesses (Glaeser & Shapiro, 2002; Harrigan & Martin, 2002). Epidemics and social distancing can be more detrimental to cities than terror threats because they tear apart the very fabric of urban life. However, we need more data to make further predictions.

6.1 Supporting Information

Social distancing exposure by sector: The percentage share of workers in teamwork-intensive, customer-facing, and physical-proximity occupations within the industry. "Communication_share" refers to the share of workers who are either teamwork-intensive or customer-facing. "Affected_share" refers to the share of workers in any of the three occupation groups.

ACKNOWLEDGMENTS

We thank Gábor Békés, Péter Harasztosi, Péter Karádi, Balázs Lengyel, Dávid Krisztián Nagy, Andrea Weber, Charles Wyplosz, and two anonymous referees for comments.

ENDNOTES

1. This chapter was originally published in Koren, M., & Pető, R. (2020). Business disruptions from social distancing. *PLoS ONE, 15*(9): e0239113. https://doi.org/10.1371/journal.pone.0239113. The Creative Commons Attribution License permits reuse.

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CHAPTER 7

COVID-19, Mobility and Entrepreneurship

Sambath Sim and Satyendra Singh

1. INTRODUCTION

COVID-19 is a contagious infection that was detected in 2019. The disease was unique in how people became ill so quickly and succumbed to death. Infected by COVID-19, over six million people perished. However, the vaccine was invented in 2020, and people have been able to take it since 2021. The vaccine is a preparation that stimulates the body's immune response against diseases and is usually administered through needle injections, orally by mouth or sprayed into the nose (CDC, 2021). When taken in the body, it generates antibodies that form protection against a specific disease. These diseases could be seasonal or pandemic, impacting citizens, healthcare systems, and economies worldwide. Following the COVID-19 outbreak, service-related firms suffered as it restricted people-to-people contact. COVID-19 also affected customer service (Camacho *et al.*, 2022). As a result, many people lost their jobs and moved to other places to find employment. COVID-19 also caused many people to become refugees in their own countries due to the job losses and livelihoods caused by the lockdown. Some people could travel overseas or to neighboring countries to get the vaccine, which gave rise to vaccine tourism. Although there is no official data, travel agencies saw an average increase of 30–40 percent in flight demand in 2021, the peak of the vaccination demand (Reuters, 2021). In Buenos Aires, travel agents advertised to get vaccinated in Miami: flight ($2000), weekly hotel ($2000), food ($350), car rental ($500), and vaccine free. So, on this trip, one could get a vaccine and vacation. People had to move to other places because vaccines were not evenly distributed worldwide. The shortage of vaccine availability in developing countries and emerging markets created an environment for vaccine seekers to travel abroad to receive the vaccine of their choice. Latin America also experienced vaccine supply delays. Wealthy nations could get vaccinated 25 times faster than the rest. The USA alone had a quarter of the world's supply of vaccines (Japan Times, 2021). Mobility for seeking medical attention became common either locally or internationally. Then, the uncertainty factor was caused by the fear that COVID-19 would kill. In Africa, there was also the rumor that people should not take vaccines as they may cause some side effects and that some countries

are trying to test the vaccine's efficacy in Africa. There have been reports of fake doses as well. This mindset also hindered vaccine administration in such areas even though vaccines were available. People also lived in slums, overcrowded camps, or settlements with limited access to healthcare, causing them to move or migrate to other places. Some people moved to places least affected by COVID-19, such as islands. This mobility of people also gave rise to entrepreneurship, such as vaccine tourism, online services, quarantine hotels, and others. Although COVID-19 did not cause people to flee their homes directly, it did displace them. Thus, it became imperative for governments to initiate programs to integrate internally displaced people and, in some cases, even refugees (Halpert & FitzGerald, 2023).

Using the Equity and Stakeholders Theories, the Chapter proposes a conceptual framework to discuss (1) the relationship between COVID-19 and mobility, (2) mobility and entrepreneurship, (3) the moderating effects of uncertainty between COVID-19 and mobility, and (4) moderating effects of skills development between mobility and entrepreneurship. The next section includes the conceptual framework and theories, followed by proposition development and a conclusion.

2. CONCEPTUAL FRAMEWORK AND THEORIES

Figure 7.1 depicts the linkages among variables applicable to this study based on the Equity and Stakeholder Theories. In the context of vaccine equity, it means vaccine for all. While access to healthcare is a universal human right, access to vaccines is not discussed to such an extent. People in developing countries and emerging markets faced barriers to accessing vaccines. At the same time, wealthy nations vaccinated up to 90 percent of their population, compared to only 10 percent in low-income nations. Countries also promoted vaccine tourism as a benefit for their industries when excess vaccines were available (Loss, 2021). Vaccine tourism is expensive as it entails flight tickets, hotel, food, and observing quarantine (Espindola & Vaca, 2022). In contrast, the poorer segment of the society in a country needs the financial capacity to pursue vaccine tourism (Kaewkitipong *et al.*, 2021). Financial status determines their ability to travel (Argo & Main, 2008). So, the inequity of vaccine availability gave rise to vaccine tourism for rich people and not all the stakeholders.

The Stakeholder Theory relates to all individuals' well-being in the COVID-19 context (Laplume *et al.*, 2008). Inclusiveness in society allows for diversity that can lead to efficient and effective solutions. Because it is most likely that the displaced people are diverse as they came from across the country searching for jobs in big cities during COVID-19, they can positively contribute to society by becoming entrepreneurs in the informal sectors. They can also be absorbed into an organization. Absorptive capacity is an organization's ability to recognize, acquire,

assimilate, transform, and use both external and internal resources. Absorptive capacity can also refer to an organization's ability to recognize and utilize the value of new information and skills. This can affect employee productivity while working with coworkers to achieve the organization's goals. An organization's diverse workforce, practical training, and human interactions can enhance employee productivity. As individuals feel more comfortable sharing their identities, the feeling of inclusion increases. This higher feeling of inclusion allows individuals to create a higher quality relationship with their coworkers and superiors (Nishii, 2013).

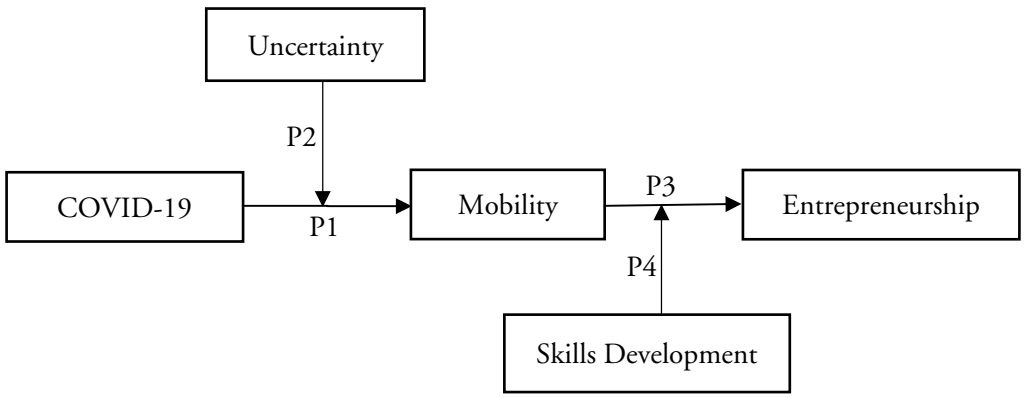

Figure 7.1: The Conceptual Framework and Theory

Source: The authors

3. PROPOSITION DEVELOPMENT

3.1 Relationship between COVID-19 and Mobility

COVID-19 forced people to move for two reasons: searching for vaccines (i.e., tourism) and searching for jobs (i.e., entrepreneurship). Vaccine Tourism is the act of traveling to another country to get a vaccine, either because of a lack of availability of vaccines in their countries, a lack of trust in their governments, a lack of confidence in the quality vaccines available to them, or simply because an opportunity presents itself (Gillespie, 2021). However, another definition is "the actions of wealthy individuals to travel to locations where they can more readily access the vaccine ahead of others" (Higgins-Desbiolles *et al.*, 2021). About two-thirds of people globally were vaccinated at least once against COVID-19, though only fifteen percent in developing countries and emerging markets (Ritchie *et al.*, 2022). While wealthy nations had promised two billion COVID-19 vaccines to donate, only 260 million doses arrived in 2021, about 15 percent of the promised doses (UNAIDS, 2021). World Health Organization (2021) recommends two doses of approved vaccinations to provide

sufficient immunity against the COVID-19 virus. The shortages of vaccine availability—which caused the mobility—were also caused by many countries' inability to approve all vaccine brands. There were ten brands of COVID-19 vaccines, out of which Pfizer/BioNTech was the most desirable, whereas COVOVAX was least preferred outside India (WHO, COVID tracker, 2022). Sputnik V was the first vaccine available on the market, though it was not approved readily by WHO or the European Medicines Agency for emergency use (Time, 2021). However, it is interesting that Sputnik is now available in over 70 countries. Further, China only recognized Chinese-manufactured vaccines to travel to the mainland, and the UK did not recognize Chinese vaccines to enter the UK (Bloomberg, 2021). COVID-19 vaccines impacted mobility both locally and globally. So, we propose our first proposition:

P1: COVID-19 leads to mobility

3.2 Uncertainty

The fear of anxiety and death caused uncertainty in peoples' lives. Anxiety related to fear of losing a loved one or themselves to death in a pandemic was a significant contributor to choosing to get vaccinated. The extent to which a person feared death led them to take actions that affected their decision-making process. For instance, individuals who fear death tend to easily fall for conspiracies that portray an agenda to control the population (Stein *et al.*, 2021) or that vaccines have negative consequences; hence, they might avoid taking vaccines and not engage in vaccine tourism (Penlington *et al.*, 2022). Likewise, having a greater degree of fear of death might scare individuals to seek vaccines by any means, considering that in some countries, vaccines are scarce. Therefore, they are forced to travel overseas to get vaccinated (Kaewkitipong *et al.*, 2021). COVID-19 gave rise to unprecedented psychological consequences and fear of death (KFF, 2021). People suffer great anxiety when they think of death, and the mere thought of it haunts them; thereby, this anxiety might lead them to believe anything that justifies their fear (Rindfleisch *et al.*, 2009). Educated people may have sufficient information not to believe the conspiracies that suggest that governments will intentionally kill people to reduce their population. In contrast, less informed people may fall for such conspiracies because people with knowledge will trust vaccines more (Penlington *et al.*, 2022).

Although about eleven billion people took at least one vaccine, another segment refused to take it due to concern that it was a Western country's ploy to kill people in Africa or reduce fertility or that the experiment was being conducted on them (Singh, 2021). These hoaxes have no scientific basis but have still resulted in vaccine hesitancy. COVID-19 resulted in over six million deaths. The rise in deaths led people to

speculate about conspiracies linking the COVID-19 outbreak to government agencies' determination to lower the world population. People do not have universally uniform thoughts. Failure of governments or concerned institutions to educate the masses by communicating and sharing research findings to improve their literacy could result in people fearing vaccines, influencing their attitudes toward seeking vaccines (Penlington *et al.*, 2022; Stein *et al.*, 2021). People's mobility depends upon where they feel safe to go and settle. Hence, we propose our second proposition:

P2: Uncertainty moderates the relationship between COVID-19 and mobility

3.3 Mobility and Entrepreneurship

Medical tourism-based mobility emerged in the late 19th century when patients from less developed nations would travel to advanced nations to receive life-saving treatment unavailable elsewhere (Connell, 2013). It attracted over 20 million patients in 2017 to travel to foreign countries to seek medical treatments (Hopkins *et al.*, 2010), ranging from organ transplants to cosmetic surgery (Horowitz *et al.*, 2007). A few countries, such as Cuba, India, Singapore, and Thailand, marketed themselves as trusted destinations for medical attention, among others. Over time, developing nations made significant investments in the health sector, enabling them to achieve the same success in treatment as advanced countries at one-tenth of their costs in the USA. Other reasons for the mobility are credibility and time (Sandberg, 2017). Shorter wait times have also significantly contributed to patients turning to medical tourism. The same concept applies to the people who live in villages or small towns, have no access to vaccines, and must travel to big cities. They may also need to relocate to different places to find suitable employment. Some may even become internally displaced or refugees in their own countries. The employment-based mobility may give rise to entrepreneurship or be a part of an informal economy.

The mobility of people can contribute to the economy. However, they may need to develop or require new skills to provide long-term benefits to entrepreneurs or self-employment in an informal economy. For this study, as these people are affected by COVID-19, their chances of success as entrepreneurs depend upon their ability to manage emotional, cognitive, and behavioral energies. Stakeholder Theory states that everyone has a unique perspective worthy of consideration. The implication is that the displaced people could be more successful than the locals. Entrepreneurs can create value for shareholders by attracting motivated people who are engaged. Engaged employees could generate more business revenue for entrepreneurs (Saxena & Srivastava, 2015). Hence, we propose our third proposition:

P3: Mobility leads to entrepreneurship

3.4 Skills Development

Displaced people may have difficulty accessing social welfare programs or may not even have a welfare system to protect them. These economic barriers prevent them from reintegrating into the workforce in a new place. One of the methods for integration is the skill development of these people. It is a pervasive method to enhance productivity and reach organizational goals (Nda & Fard, 2013). When organizations conduct efficient and practical training, employees are aware of the organization's processes and, in turn, have increased motivation to complete the task. Organizations that provide employees with regular training programs to improve their knowledge and skillsets and opportunities for career advancement help them reach their full potential (Kumar & Pansari, 2015). Employees may be motivated by financial rewards; however, less quantifiable rewards, such as work environments, may even be more critical as motivational tools (Lau & Roopnarain, 2014). This is particularly true for displaced people or refugees despite financial hardship and educational disadvantages (Meister & Mauer, 2019).

Professional development through sponsorship programs is also effective. These programs can facilitate the recruitment of humanitarian displaced people. COVID-19 displacement is a humanitarian crisis. Private sponsorship programs allow friends and families to absorb the costs of establishing themselves in a new place or country. Private sponsorship is a time- and resource-effective method for refugees, placing the responsibility on private citizens and allowing for the time inefficiencies of government bureaucratic institutions to be circumvented. It is effective as refugees settle rapidly; thus, more time is available to contribute to the economy (Kumar, 2019). Government sponsorships for refugee societal integration have evolved through innovative programs such as in Canada. Most of these types of programs and sponsorships are conducted by governments. However, this may considerably strain resources for some countries (Khanna *et al.*, 2005; Molloy & Simeon, 2016). Although direct sponsorship of employees can have a high initial cost, the loyalty of those humanitarian workers could have a sizeable long-term pay-off. Labor is an essential resource, and proper leveraging of skills and proper skill development of people can significantly benefit entrepreneurs (Qiang Li *et al.*, 2005). Hence, our final proposition is:

P4: Skill development moderates the relationship between mobility and entrepreneurship

4. CONCLUSION

The purpose of the chapter was to propose a conceptual framework and discuss (1) the relationship between COVID-19 and mobility, (2) mobility and entrepreneurship, (3) the moderating effects of uncertainty between COVID-19 and mobility, and (4) the moderating effects of skills development between mobility and

entrepreneurship. In this context, we used the Equity and Stakeholders Theories. We argued that COVID-19 leads to mobility, mobility leads to entrepreneurial activities, uncertainty positively moderates the relationship between COVID-19 and mobility, and skilled development positively moderates mobility and entrepreneurship.

COVID-19 created a situation where people had to move either for vaccines or employment. So, many people sought destinations that enabled them to get vaccinated. People also became entrepreneurs by offering travel packages or online activities. For example, travel agencies in Thailand offered vaccine tourism packages to the United States for tourists to get vaccinated before visiting tourist attractions (Thepgumpanat & Setboonsarng, 2021). These packages served as a mutually beneficial situation for both parties, as tourists could buy a vacation package that could include their vaccine of choice, and the country could get financial resources from travel. The factors contributing to an individual's trust in a particular country package include how the package was advertised, a guarantee of the type of vaccine that would be received, and the marketing done by the travel agency (Moliner *et al.*, 2007). Although factors that cannot always be determined, such as side effects from the vaccine, cannot be guaranteed. The method of marketing the vaccine tourism package and its success rates could positively contribute to the number of people purchasing it. COVID-19 also created a sense of panic and anxiety in people. Some people did not believe in the vaccine and refused to take it. Others went the extra length to travel overseas. Governments also delayed the approval of vaccines of certain brands. Literacy and media coverage were also factors in determining the extent to which people would fear the situation and take precautions by taking the vaccine and not falling victim to the hoaxes.

Displaced people should be given a chance to integrate into the society. One way to achieve this goal is to provide these people with training in the areas of their interest to transform them into entrepreneurs or employees. Firms can boost employee productivity by recognizing their psychological health and improving well-being (Lockwood, 2007). COVID-19 affected them disproportionately. Employees' better psychological well-being improves their home, work, and social life. Training managers should identify skills deficiencies to improve their employability. Dedicated and meaningful work enables employees to realize their value within the company and makes them more engaged (Osborne & Hammoud, 2017). Organizations with higher employee engagement have higher productivity and profits (Kumar & Pansari, 2015).

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CHAPTER 8

Effectiveness of Government Interventions to Combat COVID-19 in Cambodia

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1. INTRODUCTION

Since early 2020, COVID-19 has threatened our health, social life, and economy globally. The troublesome asymptomatic characteristics of the virus led governments to close schools, restaurants, movie theaters, and other public amenities as safety measures. This, unfortunately, resulted in a slowdown in the economy and a fall in the standard of living. The informal workers, employed on a seasonal, casual, or temporary basis, and lack social protection, suffered badly (Dash & Dash, 2021). However, amidst these challenges, businesses and students have shown remarkable adaptability. Students were forced to adapt to online classes, and businesses had to shift to online sales and delivery. Despite their best efforts, many businesses were forced to close, and students struggled with the transition.

Although the Royal Government of Cambodia (RGC) distributed vaccines to more than half of the population, the emergence of the COVID-19 Delta variant in a later phase means that the government still needs to close down schools and businesses (Strangio, 2021). As the education system remains vulnerable, many students faced challenges accessing adequate learning, examinations were postponed, and the quality of education was at risk. While some businesses managed to conduct their activities virtually, others faced bankruptcy and liquidation, and most importantly, the small family businesses whose operations were suspended due to the government's restrictive measures had no choice except to look for new opportunities. Therefore, knowing the effectiveness and sustainability of the government's measures and policies to combat the COVID-19 pandemic is imperative.

This chapter delves into the profound and pressing challenges that COVID-19 has inflicted upon Cambodia's economy and education system. We also critically assess the efficacy of the Royal Government's measures in combating the far-reaching effects of the pandemic.

2. LITERATURE REVIEW

Governments generally use legislation, taxation, and subsidies to counteract market inequity. They can also engage in the market to improve economic justice. One of the most prevalent and well-understood justifications for government involvement is to maximize social welfare. For instance, when the threat posed by COVID-19 to the United States became apparent, political leaders and commentators began advocating for large-scale government actions to counter the health and economic consequences. The belief was that COVID-19 requires a stronger, more interventionist government in line with the "national conservative" movement, which argues for government intervention in the economy to achieve various goals (Thomas, 2020). In China, however, while these intervention policies vary by location, they consistently attempt to lower population interaction rates and minimize viral transmission. Although lockdown, school closure, centralized quarantine, and mask-wearing were effective in controlling the virus transmission and put forward by several governments, based on the scenario analysis, governments by enforcing school closures, compulsory mask-wearing, and centralized quarantine could achieve identical viral transmission control results to counteract economic repercussions, and this could be without implementing lockdown policies (Zito & Chen, 2020).

Cambodia's government's approach to the pandemic was outstanding. Its COVID-19 Master Plan called for improving the health system, assisting workers and businesses, and distributing cash transfers to disadvantaged households. The government's reaction reportedly cost $815.7 million (3.1 percent of GDP), eventually escalating to $1.36 billion (5.1 percent of GDP). Despite precautions, the outbreak has had a significant social and economic impact. The conventional fields of tourism and garment, textiles, and footwear (GTF) were severely affected. Beginning in March 2020, the construction project halted, and over 119,000 Cambodian migrant laborers were repatriated from Thailand. The economy was predicted to decline by 1.9 percent, from 6.8 percent before COVID-19 to 4.5 percent in 2020 (Thomas, 2020).

Since the community outbreak in February 2021, although the shock of global demand and lockdowns impacted Cambodia's economic activity, it has slowly recovered due to increased investment in the trade agreement between China and Cambodia (CCFTA). Also, Cambodia's agricultural sector greatly benefitted from the Regional Comprehensive Economic Partnership (RCEP). The Royal Government of Cambodia also introduced fiscal and monetary support by providing a US$719 million budget for economic relief and recovery in 2021. However, despite these efforts, there were still significant challenges and risks. These include rising unemployment, inflation, and a potential decrease in foreign investment. Thus, although the government took extreme measures to restore the economy, challenges

continued to persist, as Cambodia's growth model already showed weaknesses even before the pandemic hit the country (World Bank Group, 2021).

Although the global pandemic significantly impacted the world's economy, Cambodia's government was relatively successful in managing health risks and mitigating social and economic consequences. Cambodia was considered one of the Southeast Asian countries with remarkable success in vaccine distribution. As of September 6, 2021, over two-thirds of the country's population had received at least one dose of vaccine, and the highest percentage in Southeast Asia, 53 percent, was fully vaccinated (Strangio, 2021). Cambodia demonstrated the success of this vaccine distribution program due to the country's contained geography and small population. On the other hand, The Ministry of Labor and Vocational Training (MLVT) provided an update on the garment industry to safeguard businesses' survival. The manufacturing sector showed indications of recovery by the end of 2020, with 112 factories opening compared to 129 firms closing throughout the year, which indicates robust growth potential as regional value chains continue to evolve (Asian Development Bank [ADB], 2021). In the medium term, however, the chances for tourism to return and fuel growth remained alarmingly doubtful due to nearly half of tourism-related businesses being forced to close. Nevertheless, the government indicated a solid commitment to take proactive measures to support health, social assistance, and economic sectors during the pandemic.

3. METHODOLOGY

In this research, we primarily use data from secondary sources. We collected data virtually from online publications, media articles, organization reports, and research papers to help us achieve our objectives. To improve our research's clarity and credibility, we only used data published in 2020 onward and from trusted sources, including the World Bank and UN organizations. These sources were selected based on their reputation for providing accurate and reliable data on economic development and government interventions. Moreover, we collected press releases of organizations or associations related to the effectiveness of government interventions, expert analysis, and reports or official documents of Cambodian ministries such as the Ministry of Economy and Finance, including the Supreme National Council of Cambodia, to ensure that our findings and discussions are reliable and accurate. Also, we concentrated on discussing the statistics critical to Cambodia's government intervention.

4. IMPACT ON BUSINESS ENTERPRISES AND EDUCATION SYSTEM

The spread of the COVID-19 pandemic has influenced how we live, and Cambodians are no exception. This prolonged epidemic has the potential to overwhelm the

interconnections comprising multiple stakeholders. This resulted in a substantial slowdown in Cambodia's primary sectors in the first quarter of 2020.

4.1 Impact on Business Finances and Operations

The COVID-19 pandemic has profoundly impacted family businesses and enterprises, particularly in terms of their financial and operational management. These firms' most significant financial challenges include sales distributions, rent expenses, payrolls, current liabilities, and bank overdrafts. However, the true extent of the pandemic's impact may only become apparent in the long run, with potential consequences that could significantly affect corporate survival. Operational challenges, such as securing funding, logistics disruptions, system failures, transportation issues, and a lack of protective gear, further exacerbate the situation (United Nations Industrial Development Organization [UNIDO], 2020).

4.2 Impact on Business Revenues

The pandemic significantly impacted firms operating for five to 14 years, resulting in a drastic decline of over 80 percent in revenues. These were primarily large corporations engaged in manufacturing finished items for export. Additionally, there has been a significant decrease in net profits for food and beverage and agricultural food production by 70 percent and 50 percent, respectively. This decline is primarily a result of the government's regulations to combat the outbreak, which included city-wide lockdowns and the temporary closure of food courts, schools, and major events like wedding receptions. These measures have directly impacted the demand for agricultural raw materials and the supply of food products (UNIDO, 2020).

4.3 Impact on the Quality of the Educational System

On March 16, 2020, the Ministry of Education, Youth and Sport (MoEYS) decided to suspend all educational institutions, private and public, from pre-schools to universities. The school closures have affected all 13,482 schools in Cambodia, involving 3,210,285 learners and 93,225 instructors (Chhy, 2021). The most direct consequence for pupils has been the temporary discontinuation of face-to-face school instruction. Teachers, on the other hand, were also greatly influenced in terms of professional teaching. Both students and teachers put their efforts into adapting to the new demanding approach of virtual learning. Since Cambodia has been culturally reliant on physical education, the abrupt transition to e-learning was difficult for them to adhere to. Although MoEYS arranged online class channels such as broadcasting via TV, radio, and YouTube, this technique proved unsuccessful as students from rural areas were unable to access the platforms due to poor technology (Chheang & Khut, 2020). Moreover, the lockdown has also negatively influenced the 2021

National Budget. In response to the ongoing issues, in 2021, the Ministry of Economy and Finance (MEF) published a reduced budget expenditure for all ministries, including the MoEYS, which was necessary to safeguard the routine operation of state institutions and the sustainability of people's daily lives (Long, 2021). With limited financial support, the government needed to work on ensuring the effectiveness and efficiency of providing a standard education.

Based on this, we conclude that the lockdown measures, school suspensions, and the new budget restraint policies adversely influence the effectiveness of learning outcomes in Cambodia. Specifically, we have observed a decline in academic performance, decreased student engagement, and a widening educational gap between urban and rural areas.

4.4 Impact on the Mental Health of Students

The COVID-19 in the Kingdom has hit the children's education hard. According to the United Nations Children's Fund (UNICEF), many pupils in Cambodia experienced threats to their well-being. The risk of violence, parental abuse, and exploitation increased moderately due to the extended school closures. Consequently, these students were confirmed to have struggled mentally and psychologically, including loneliness, anxiety, or depression. The study further indicates that the rate of students dropping out was higher than the one when schools were in session. E-learning was a completely new experience for the majority of students in Cambodia. During online study, students easily lose focus due to an inappropriate environment for studying, as some households can be noisy and uncomfortable. Also, home is not a suitable environment for most of them to concentrate. Under these circumstances, it is understandable that the students were not mentally and psychologically prepared for the new challenges (UNICEF, 2021).

4.5 Impact on the Implementation of the Education Strategic Plan (ESP)

The pandemic has significantly impacted the quality of education in Cambodia and hindered the progress of the Education Strategic Plan 2019-2023. This strategic plan, which includes two medium-term policies, aims to ensure inclusive and equal education, promote lifelong learning opportunities for all, and ensure effective leadership and administration of education officials at all levels. However, the government's response to the pandemic has hindered the progress of this plan (MoEYS, 2020).

5. GOVERNMENT INTERVENTION MEASURES

The Royal Government of Cambodia (RGC) took extreme measures to combat the economic immobility caused by the COVID-19 pandemic. The stimulus packages, which include a $815.7 million package, equivalent to 3.2 percent of the country's

GDP, could lead to an increase in real GDP of $1.2 billion after a year and $1.3 billion after two years. The government entrusted the Committee on Financial and Economic Policy to create four working groups to implement the COVID-19 measures (Asian Development Bank, 2020).

1. Budget preparation, finance, and social relief policies: The government is committed to managing finances to fight the pandemic, providing substantial aid to poor and vulnerable households, and supporting businesses in these challenging times.
2. Organize the social relief policies: The Royal Government of Cambodia has established clear criteria for identifying poor and vulnerable households that need funding.
3. Proactive management of supplies and logistics: The government is taking decisive steps to manage the quantity, quality, and pricing of certain goods, such as medical supplies and food, ensuring availability and affordability.
4. Monetary and fiscal policy to pitch into the effect of COVID-19 and the withdrawal of the everything but Arms (EBA): Prepare a budget for financing and maintain countrywide stability under the impact of the global pandemic.

5.1 Business Enterprises

Recognizing the challenges faced by our workforce in the current environment, the government is stepping up to provide support. We encourage new startup companies to explore the digital world, offering them a chance to thrive in these uncertain times. We provide technological and soft skills training for our unemployed workers in the tourism sector and the garment, textile, and footwear (GTF) industry. We also offer a more advanced technical course for non-GTF industry workers, accompanied by a $120 monthly cash incentive for six months. Our response plan also includes tax relief for sectors affected by the pandemic. We have exempted $97.6 million worth of tax up until December 2020. Hotels, guesthouses, and restaurants in seven provinces were exempted from all taxes for up to six months. Registered airlines were also not required to pay tax until July 2020, and factories that suspended operations were exempted from their National Social Security Fund (NSSF) (Asian Development Bank, 2020).

In a move to bolster the economy, the Government has extended the tax exemption for businesses, including hotels, guesthouses, and restaurants, until the end of September 2021. This measure, coupled with the exemption of NSSF contribution based on socioeconomic factors until the end of December 2021, is expected to provide significant relief to affected businesses. Additionally, the support for the aviation sector, which includes the suspension of minimum tax payments until the end of September 2021, aims to alleviate financial pressures (O'Connell, 2021).

Following a significant spike in COVID-19 cases, Cambodia announced a two-week lockdown on April 14, 2021, in Phnom Penh, two months after the February 20, 2021, event. The RGC promptly classified the city into three zones: red, dark yellow, and yellow. The lockdown was lifted on May 5, 2021, with the red zone remaining locked (DCA *et al.*, 2021). To combat the spread of the highly contagious delta strain, the RGC implemented several measures. This included a lockdown in provinces bordering Thailand, the closure of the Cambodia-Thailand border, and the enforcement of a curfew in Phnom Penh and other towns from 9:00 PM to 3:00 AM (U.S. Mission Cambodia, 2021).

Cambodia is one of the fastest countries to implement vaccination programs since February 2021. Data shows (as of today) that 27.4 million vaccine doses were given, with 13 million people fully vaccinated, equivalent to 77.8 percent of the total population (Our World in Data, 2021). In the World Health Organization (WHO) Western Pacific Region, Cambodia has the highest rate of people who got two doses of the coronavirus vaccine. The requirement for citizens to show their vaccination cards is a smart and time-saving approach to ensure that businesses can operate and that the macroeconomic situation will prosper again (United Nations Country Team [UNCT] Cambodia, 2021).

5.2 Educational System

The Government allocated a budget of $6.8 million to implement strategic plans for the educational sector. In response to the threat of COVID-19, MoEYS took early initiatives and procedures to ensure continuous learning for students. Comprehensive instructions, guidelines, and directives were developed and distributed nationwide. MoEYS also distributed documents promoting proper hygiene. The ministry suspended schools in some provinces in mid-March and subsequently issued a statewide shutdown of all educational institutions. In a move to ensure the continuity of education, the Government announced teleworking arrangements for all education sector employees. This decision allowed for the seamless operation of the sector, despite the physical closure of educational institutions. In April 2021, MoEYS issued a directive about implementing remote learning and online classes for all levels of education. To support the introduction of distance learning, MoEYS developed an operational guideline. This guideline plays a crucial role in implementing the directive at the national, subnational, and educational institution levels and in developing remote learning programs (MoEYS, 2020).

The major component of the strategic measure is to develop remote learning for students from early childhood education (ECE) to higher education. Since students in these grades appeared on yearly countrywide tests, MoEYS prepared online classes for Grade 9 and 12 pupils in March 2020. MoEYS created remote lessons for pupils

from lower to higher educational levels, including those from ethnic minority communities and children with hearing difficulties. These programs were available on Facebook, YouTube, and the U-Learning portal (MoEYS, 2020).

MoEYS is resolutely dedicated to achieving the U.N. educational goal from 2019 to 2050, guided by the principles of comprehensiveness and the promotion of lifelong learning opportunities for all. The ESP, a key instrument in this pursuit, is set to undergo assessment in two stages. The first stage, a mid-term assessment in 2021, will be followed by a comprehensive evaluation in 2023. These assessments are designed to scrutinize the program's impact on education sector improvements, in perfect harmony with the Royal Government's goal for Cambodia's socioeconomic growth and reform programs (The Phnom Penh Post, 2021).

5.3 Evaluations on the Effectiveness of the Government Measures

During the first outbreak of COVID-19, it was unimaginable to think the world would survive the pandemic. Like any natural disaster or crisis that has struck unexpectedly and suddenly, the lockdown shocked all (Mehta, 2020). Given the rapid spread of this contagious virus, governments have started to implement and enforce many social restrictions, with lockdowns being at the forefront of those measures that aim to assist in lowering overall transmissions and deaths. Even though the lockdown was demonstrated to prevent the COVID-19 pandemic successfully and indicated that this preventive measure could considerably reduce the virus's transmission, it had a long-term and disproportionate impact on all businesses and educational systems, particularly the poor and vulnerable. Not only that, it significantly influenced their daily life but also businesses that were forced to cease or suspend operations. However, due to the fast-growing youth population and better accessibility to the Internet, businesses are now using digital marketing to sell and market their products. This shift to digital platforms has not only helped businesses survive during the pandemic but also opened up new opportunities for growth and expansion. For instance, new social media platforms and apps are constantly being introduced to the market, and COVID-19 has accelerated the uptake of these technologies in Cambodia (B2B, 2021).

For this reason, more businesses shifted their strategies and adapted to the pandemic by creating better online content, implementing various online payment methods, and developing apps. On the contrary, while digital marketing is incredibly advantageous to most businesses, smaller and less fortunate local enterprises cannot access the Internet. While everything is forced to shut down, the Government has also implemented a tax relief plan that allows businesses to postpone paying taxes until COVID-19 disappears. Without a doubt, we feel that this implementation has mitigated the issues of bankruptcy and closure of most firms. On the other hand,

classifying different zone restrictions and enforcing curfews were also critical in combating the spread of this virus. Operation of certain businesses such as nightclubs, karaoke, gyms, and cinemas were all prohibited by the Government of Cambodia. In the same way, children were also forced to adapt to sudden lockdowns and limited availability of learning material. However, only some students have access to the Internet. Even though it effectively reduces the number of COVID-19 cases, we believe the school shutdown will lead to more school dropouts and psychological discomfort among children. The potential long-term effects on children's education and well-being are a matter of great concern, as most children have never experienced or been familiar with e-learning before, and now they must learn to adjust to this new environment, which requires strong self-motivation and time management abilities. Furthermore, it is self-evident that the lack of social interaction in online learning can result in emotions of isolation, stress, and demotivation.

However, until now, the World Health Organization has been working relentlessly with partners to discover, manufacture, and distribute safe and effective vaccines that can protect against disease, infection, and transmission. To illustrate, while COVID-19 vaccinations have yet to be proven successful in preventing transmission, studies suggest that they are beneficial in reducing significant disease and death (National Center for Immunization and Respiratory Diseases (U.S.) Division of Viral Diseases, 2021). Today, more than 11.5 million people over 12 have been vaccinated by the Royal Government (UNICEF, 2021). Even though most Cambodians have received their third dose of vaccination, for the foreseeable future, we must continue to wear masks, wash our hands, ensure good ventilation indoors, and physically distance ourselves from crowds. Recently, the Government introduced a new measure requiring all citizens to show their vaccination cards before entering any place. We believe that this is an excellent approach to ensure that businesses can operate safely and that the economy can begin to recover.

6. CONCLUSION AND RECOMMENDATIONS

In conclusion, COVID-19 has harmful effects on business and education. Several studies conducted by individual experts and organizations focused on the critical role of Government measures and their impact on business operations, companies' growth, market development, education delivery, student mental well-being, and others. In addition, government initiatives in budgeting, finance, welfare spending, social relief policies, and logistics are critical. We intend to explore several measures implemented by the Royal Government to counteract the spread of the pandemic, including certain limitations.

Even though the pandemic was unavoidable, prioritizing citizens' welfare is the key to good physical and mental health. The Government should extend its support

to educational, technical, and vocational institutions to provide market-oriented education and training for skills development based on the job market and broaden employment opportunities for the people. The pandemic has worsened the current economy and created critical problems for families and individuals. As such, solid short-term and long-term measures should be taken targeting people who are economically weak and need special attention for their vulnerabilities. Building a supportive ecosystem for businesses can encourage growth in the public and private sectors. This can lead to achieving sustainable development goals and creating a more resilient and safe business environment for new and existing entrepreneurs.

When it comes to educational reform, it is paramount that the Government ensures all students have equal learning opportunities. This includes access to available resources, particularly technological support, such as laptops, tablets, and IT technicians. The Government should pay special attention to the needs of pupils from economically disadvantaged families, who often have limited resources and are at risk of dropping out. It is also crucial for stakeholders such as parents, local authorities, teachers, community, and non-governmental organizations (NGOs) to collaborate with these policies. This collective effort is necessary to ensure the effective delivery of education and prevent students' mental ill health. It requires open and effective communication among all parties - ministries, the private sector, and Government units.

This research is not free from certain limitations. Our study is entirely based on secondary data, and its reliability depends on data accuracy. Future researchers might consider the opportunities to conduct research during the COVID-19 pandemic on industrial growth, digital economy transformation, and online classes and curricula development. Notably, COVID-19 created a platform for academics, business owners, employees, consumers, and others to adapt to the digital transformation in conducting activities.

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CHAPTER 9

Prospects and Challenges of Cambodia's Transport Industry

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1. INTRODUCTION

The service industry, encompassing a wide range of sectors such as finance, insurance, banking, tourism, education, transportation, and others, is one of the most significant contributors to a country's industrialization and economic growth. Cambodia, with its remarkable economic growth rate averaging 7.7 percent annually from 1998 to 2019, is recognized as the fastest-growing economy in Asia (World Bank, 2023). To sustain this growth, Cambodia needs to develop its service industry further. As of 2023, Cambodia's service sector contributed significantly to the country's GDP, accounting for 36.2 percent, next to industry (Statista, 2024). Notably, between 2012 and 2016, the service sector attracted over 50.0 percent of Cambodia's total foreign direct investment (FDI) inflows, surpassing Myanmar (43.0 percent) and even Malaysia (38.0 percent) (Aquarii BD, 2022).

This chapter aims to provide valuable insights into Cambodia's overall transportation business landscape. Although the role of transportation in the service industry's development is well recognized, recent studies indicate that this sector confronts various obstacles that impede its growth. In addition to the existing barriers, Cambodian transportation enterprises have encountered significant obstacles due to the global COVID-19 pandemic, which has continued to affect them during the recovery phase. The global pandemic forced many businesses in the service sector to suspend their operations, while some went bankrupt and finally closed down (Dash & Dash, 2021). In light of these challenges, based on primary and secondary data, this chapter seeks to offer a comprehensive understanding of Cambodia's transportation industry within the service sector by signifying its crucial role in Cambodia's economic development and identifying factors that contribute to its prospects and pose challenges.

The following section, through the literature review, presents an overview of the transportation sector in Cambodia, including its prospects and challenges. It then discusses the methodology used in this study. Subsequent sections present the findings and discussion, followed by the conclusion and recommendations.

2. LITERATURE REVIEW

2.1 Overview of the Transportation Sector

The significance of the transportation sector lies in its contribution, allowing people and goods to move within and outside the country. This sector encompasses various components, including railroads, railways, ports, and airports (Hayes, 2021). According to the World Bank (2023), Cambodia's economy grew by 5.2 percent in 2022, supported by the service sector, which includes trade, travel, and hospitality. This growth was further enhanced by the influx of foreign visitors for the Southeast Asian Games and ASEAN Para Games hosted in Cambodia.

The Asian Development Bank (ADB) emphasized the critical role of transportation in bolstering the four primary drivers of Cambodia's economic growth: agriculture, tourism, manufacturing, and commercial and residential construction (ADB, 2019). Citing data from the Organization for Economic Co-operation and Development (OECD, 2019), the World Bank, and the Asian Development Bank, Aquarii BD (2022) reported that, in 2019, the transportation and storage sector substantially contributed to the economy, accounting for 7.8 percent of Cambodia's GDP and valued at US$ 2.1 billion.

2.2 Prospects of the Transportation Sector

Development of Transportation Infrastructure

Among various sub-sectors of the transportation industry, road transport, the largest sub-sector of Cambodia's transportation industry, plays a pivotal role, accounting for over 90 percent of passenger and freight transport (ADB, 2019). The country's extensive road network, exceeding 60,000 kilometers, with over 15,000 roads and 4,000 bridges, facilitates this dominance (ADB, 2019). The annual increase in vehicle registrations, consistently reaching double-digit growth, underscores the popularity of road transport. Notably, motorcycles have emerged as a preferred mode of transport, representing 85 percent of all vehicle registrations in 2017 (ADB, 2019).

Railway transport, a significant part of Cambodia's transportation industry, is also a champion of eco-friendliness. The railway system comprises two lines that total 652 kilometers and is recognized for its lower carbon emissions and energy efficiency. One line connects Phnom Penh to Poipet, while the other links Phnom Penh to

Sihanoukville Port. This system effectively utilizes existing railway assets at a low cost, contributing to Cambodia's sustainable development goals (ADB, 2019).

Cambodia's two international ports, Phnom Penh inland and Sihanoukville on the coast play a pivotal role in the country's economic growth by facilitating international trade. These ports, along with the ten airports, including Phnom Penh, Siem Reap, and Sihanoukville, and the upcoming Techno Takhmao International Airport, are crucial in connecting Cambodia to the global market. With a solid infrastructure and a growing budget for national transport infrastructure, these ports and airports are well-equipped to meet the country's developmental needs and the increasing demand for international trade. Over five years, from 2014 to 2018, the national transport infrastructure budget surged, i.e., US$ 123.75 million in 2014, US$183.75 million in 2015, US$223.04 million in 2016, US$216.70 million in 2017, and US$158.07 million in 2018 (ADB, 2019). The National Strategic Development Plan (NSDP) 2014–2018 planned a sector expenditure program of US$910.40 million to enhance the economy through better transport infrastructure (ADB, 2019). Cambodia's focus on improving the transport network is a testament to its commitment to strengthening transport connectivity and building vibrant logistics systems to enhance the economy's competitiveness.

Cambodia has garnered international attention and support from the private sector and foreign nations to further boost its transportation infrastructure. According to a study by the Henan Provincial Communications Planning Survey and Design Institute, Hor (2014) reported that by 2040, Cambodia will need to construct 2,230 kilometers of roads, requiring an investment of approximately US$26 billion. This plan includes the development of a ring road around Phnom Penh and six expressways connecting various provinces. From 2014 to 2018, the external funding for national and provincial roads was primarily sourced from several countries: The People's Republic of China (38.5 percent), Japan (37.9 percent), The Republic of Korea (12.0 percent), and multilateral development banks (11.6 percent), including the Asian Development Bank and the World Bank (ADB, 2019).

Investment and technical assistance projects within the Greater Mekong Subregion (GMS), which includes Cambodia, The Lao People's Democratic Republic, Myanmar, The People's Republic of China, Thailand, and Vietnam, reached US$30.3 billion. These projects aim to enhance various sectors, including transport, trade, agriculture, environment, energy, urban development, health, cooperation, and tourism (GMS, 2021). Among these sectors, the development of the transport industry through infrastructure expansion remains a critical component of the GMS program. This initiative has led to constructing, upgrading, or improving approximately 12,500 kilometers of roads and over 1,000 kilometers of railway lines (GMS, 2021). Furthermore, under the regional investment framework 2022, 205 investment and technical assistance projects in priority areas are estimated to be valued at around

US$77.6 billion, with approximately 85.0 percent of the total earmarked for transportation (GMS, 2021).

Digitalization in the Transportation Sector

Besides developing physical infrastructure, Cambodia has made remarkable improvements in digitalizing the transport sector. Today's digitalized world offers several opportunities, making it convenient for people to connect. Toward digitizing the transportation sector, in 2021, the Logistics Business Association collaborated with the Cambodian Digital Technology Association to boost digital use in the logistics and transportation sector, promote local digital technology and logistics services, and help small and medium enterprises in Cambodia (Chea, 2021). Moreover, both encourage each other to adopt a digital system to provide more functions to people to expand their businesses. According to Chea (2021), the partnership aligns with the government's policy to boost Industry 4.0, indicating the government's commitment to advancing the transportation industry. The private sector must follow suit since the government's public service has become digitalized. Further, the Cambodia Logistics Association also collaborated with Feed the Future Cambodia Harvest II (a USAID-funded project) to overcome the challenges within the logistics in the agricultural sector and provide solutions and investment opportunities for improving innovative logistics systems and management in the supply chain.

2.3 Challenges in the Transportation Sector

Despite facing several challenges, Cambodia's transportation sector has the potential for significant improvement with funding support from external sources. These challenges, including infrastructure and road safety, are being addressed. Cambodia's road network, while currently considered to be of a low standard, is a prime area for improvement (Sisovanna, 2019).

Infrastructure Challenges

According to the Economic Research Institute for ASEAN and East Asia (ERIA), Cambodia has a problem with poor physical infrastructure as the transport network cannot meet the rapidly growing demand for transport facilities and services. This is caused by a lack of paved provincial roads and the low durability of unpaved roads in rural networks (Sisovanna, 2019). Climate change, including heavy rain and floods, has also affected sustainable infrastructure development. Further, according to the "*Improvements and Challenges Associated with the Facilitation of Road Transport in Cambodia,*" traffic congestion and accidents have risen because the public mass transport system has not yet been introduced (Sisovanna, 2019). Although lack of

government subsidies and public interest were responsible for the failure of the first trial of bus services in 2001, the second trial of bus services, supported by the Japan International Cooperation Agency (JICA), successfully launched 10 buses in 2014.

Road Safety

According to the Asian Development Bank (2019), Cambodia's road transport fatality was still higher even though several efforts were made to reduce it. The causes of transportation crashes are road user errors, lack of sufficient education on driving safety, and destructive behaviors such as speeding, driving when drunk, driving against traffic laws, and refusing to use helmets by motorcycle riders. These crashes cause suffering, fear, and trauma to victims and their families, negatively impacting the economy. One of the top priorities for improving road safety is to encourage behavior-based road safety. With a limited budget and human resources, in 2006, the government initiated a national road program through the Ministry of Public Works and Transport's National Road Safety Committee to improve the road safety program in Cambodia.

3. METHODOLOGY

This research relies on primary and secondary data to meet its objectives. As a qualitative research, we conducted ten key informant interviews with senior professionals with broad transport industry experience. We also gathered secondary data from relevant sources, including the World Bank, Asian Development Bank, government agencies, and other web sources related to the potentialities and challenges of the transport sector in Cambodia.

Primary data were recorded, transcribed, and thematically analyzed to understand the topic coherently. The information from the key informants related to the availability of opportunities, major challenges, current trends, government policies, and recommendations was useful in responding to the research questions.

4. FINDINGS AND DISCUSSION

4.1 The Current and Future Trends of the Transportation Sector in Cambodia

Based on data from the World Bank (2023), 5.2 percent of Cambodia's GDP is accounted for by the service sector's help, including trade, travel, and hospitality. This could happen with the involvement of Cambodia's 60,000 kilometers of road length and above 4,000 bridges (ADB, 2019). On top of that, Cambodia's freight and logistics market size has been growing steadily and is expected to continue to expand

from 1.84 billion in 2023 to 2.23 billion US dollars by 2028 (Mordor Intelligence, 2023). The trucking industry comprises three segments: companies specializing in international container freight, registered companies of different sizes, and small businesses expected to register soon (Mordor Intelligence, 2023).

Regarding current trends, the key informant interviews revealed a noticeable shift towards online booking and payment methods in the bus transportation segment. Cambodia's Bus businesses increasingly rely on user-friendly websites and applications to facilitate easy booking and payment processes. Moreover, there is rapid growth in e-logistics within the retail and wholesale sectors, driven by the rising demand for quick commerce. Logistics companies are forming partnerships with online marketplaces and social commerce sellers, creating mutually beneficial opportunities. The younger population, who are enthusiastic users of e-commerce, are also introducing online shopping to older generations, indicating positive prospects for Cambodia's transportation industry in logistics goods (Aquarii BD, 2023).

For future trends, Cambodia strategically plans a high-speed train from Phnom Penh to Poipet, supported by a concessional loan from China. The Cambodia Chamber of Commerce vice president considered this a forward-looking initiative that aims to boost the economy by efficiently transporting passengers, tourists, and agricultural products. Additionally, the project positions Cambodia for potential collaborations with neighboring ASEAN countries, signaling a significant investment opportunity for future economic growth (Vanyuth, 2023).

4.2 The Influence of Transportation Industry on Other Sectors

In the era of globalization, every country has to have connections, as do the sectors in a country that impact each other. The transportation sector in Cambodia plays a critical role in driving the country's economy and has significant implications for various sectors, such as tourism, agriculture, manufacturing, and others.

The transport infrastructure is vital for the growth of the tourism industry in Cambodia, as it enables tourists to travel to different parts of the country and visit various tourist destinations. In 2022, by boosting tourism, Cambodia's international tourism earnings reached US$1.41 billion, and earnings from domestic tourists reached US$650 million (Pradeep, 2023). Cambodia received around 2.28 million international tourists in 2022, an increase of 1058.6 percent from 2021, and the sector contributes about 3.6 percent to the country's GDP (Pradeep, 2023).

Moreover, the transport sector is vital for the growth of the agriculture sector, as farmers need efficient transportation to move their agricultural produce from rural areas to markets across the country. Of the total population, 76 percent live in rural areas, and agriculture provides 31.2 percent of total employment, contributing 20.7 percent to the country's GDP in 2021. This emphasizes the need for a well-

functioning transport system to boost agricultural activities in the country (Open Development Cambodia, 2021).

Further, the transport sector plays a crucial role in the growth of the manufacturing sector, particularly the garment industry, which is a major contributor to Cambodia's economy. Garment manufacturing units depend on transport infrastructure to distribute their goods within the country and export them to international markets. Textiles, clothing, footwear, and food and beverages makeup 80 percent of the country's manufacturing value added. These sectors are the largest employers, with 1.4 million workers engaged in manufacturing (UNDP, 2020).

4.3 The Prospects and Opportunities of the Transportation Sector in Cambodia

Cambodia offers tremendous prospects for entrepreneurs in the field of transportation to enhance the standard of their transport companies and Cambodia's reputation in the transportation services industry. Each form of transportation has distinct functions that serve different purposes, opening up many business opportunities.

Transportation is the most essential element that enhances growth in other key sectors, such as agriculture, tourism, manufacturing, and construction. Cambodia's transport contribution to GDP surged to 4204.40 KHR Billion in 2023 from 3889.50 KHR Billion in 2022. GDP from transport averaged 2253.70 KHR Billion from 1998 until 2023, reaching an all-time high in 2023 (Trading Economics, 2024). The World Bank's Global Logistics Performance Index placed Cambodia 98th out of 160 countries in overall logistics performance, which indicates the potential for growth in this sector (OECD, 2021). However, there is no official claim on the amount the transportation sector contributes to Cambodia's GDP as it indirectly facilitates other industries. For example, the travel and tourism industry, which depends significantly on transportation, comprised 32.7 percent of Cambodia's GDP in 2019 (Knoema, n.d.).

Another prospect is the urban development plan and logistic network performances. The area and population of Phnom Penh have grown significantly. The land area of Phnom Penh nearly doubled in 2010 when 20 communes from different provinces were merged into the city. From roughly 2.00 million in 2018 to 2.87 million in 2035, the city's population is expected to grow gradually, which needs sustainable transportation systems, including public transit systems, airports, train stations, electric vehicles, ride-hailing services, ferry terminals, pipelines, and warehouses. In 2014, the Japan International Cooperation Agency (JICA) supported an urban transport plan for Phnom Penh, aiming for a balanced road, public, and traffic management system.

While digitalization is a requirement of each industry in Cambodia's economy, Nikolas Hatz, a Senior Lead Consultant in Tourism Development for the GIZ ICONE program, stresses the need for businesses to go digital to stay competitive. Customers expect companies to provide online solutions, like digital ordering, payment, and tracking, in today's digital world. Being online is crucial in tourism since modern travelers use the Internet for inspiration, planning, booking, and payments (Pazo, 2023).

In addition, our interviews with professionals (key informants) in the transportation sector reveal that legal provisions play a key role in making transportation services safer and more dependable. Internal rules within a company could target how things should be done, like how drivers should qualify and the standards vehicles must meet. In a competitive environment, laws ensure fair competition by eliminating monopolies or unfair practices that could harm customers or other businesses. The transport sector can attract investments to strengthen its infrastructure with effective laws and regulations and high investor confidence.

4.4 The Challenges Faced by Entrepreneurs in the Transportation Sector in Cambodia

With the technological advancements, entrepreneurs in the transportation sector have encountered several challenges. Our interviews with local transportation companies reveal their concerns, such as booking mistakes, emphasizing the importance of clear communication during online or offline ticket purchases. Besides, safety is a top priority for customers, with the quality of drivers being a significant concern. Customers seek drivers with solid technical and professional skills to ensure a secure journey. Another challenge is the prevention of vehicle breakdowns, as these incidents inconvenience customers and lead to negative reviews. Some behaviors like talking aggressively, ignoring customers, poor work performance, resisting change, and lack of responsibility can substantially reduce customer satisfaction.

The transport sector's broader challenges include poor infrastructure, a lack of good roads in provinces, and challenges with roads in rural areas. Cambodia's transportation services are hindered by poor road, river, and railroad maintenance, with 2.7 kilometers of roads per 1,000 inhabitants and one of the lowest road densities in Southeast Asia, affecting road and river maintenance and increasing travel duration, expense, and risks. The Economic Research Institute noted many issues in Cambodia's infrastructure, particularly transportation. For instance, in 2019, Cambodia had five domestic ports and airports. The neighboring country, Thailand, has 404 domestic ports and 31 airports. Thus, it is challenging for businesses to meet the increasing demand for transportation as they lose an advantage in this sector compared to other nations (ASEAN Stat, 2022). Further, there is a lack of adequate

infrastructure and facilities. Cambodia lacks enough international airports, deep-sea ports, or river ports to accommodate the country's expanding transportation needs. The lack of bridges over the Mekong River impedes cross-border trade and integration. Moreover, the high cost and difficulty of obtaining licenses also pose challenges. The transportation industry is heavily regulated, requiring multiple licenses, permits, and registrations from different agencies, including the Ministry of Economy and Finance, the Ministry of Public Works and Transport, the Ministry of Commerce, and municipal governments (ADB, 2019). The processes entail numerous fees and taxes and are frequently intricate, expensive, and time-consuming. Also, there remains a low level of innovation and technology adoption. Due to its heavy reliance on antiquated and ineffective machinery, systems, and vehicles, the transportation industry has incurred significant fuel consumption, emissions, and maintenance expenses. The industry does not use contemporary digital technologies that might improve consumer happiness, convenience, and service quality, such as GPS, e-commerce, e-ticketing, and e-payment (Endava, 2022).

These challenges require concerted efforts from the government, the private sector, and the development partners to address them and enhance the potential of the transport sector in Cambodia.

5. CONCLUSION AND RECOMMENDATIONS

The transportation sector in Cambodia plays a pivotal role in connecting various industries and driving economic growth. As the country strives to achieve upper-middle-income status by 2030, the sector emerges as a key player in this transformative journey. The sector's contribution to GDP, coupled with its influence on tourism, agriculture, and manufacturing, emphasizes its significance in the overall development of Cambodia. The study has highlighted the current and future trends in the transportation sector. The prospects for entrepreneurs in the transportation industry are substantial, with opportunities for business expansion and contributions to Cambodia's economic prosperity. There are also some potential challenges in the area of technology and infrastructure.

Digital transformation, new collaboration plans, skills development, strategic marketing, and investment promotions are needed to achieve further development in the transportation industry. The innovative measures can help Cambodia capitalize on the growth potential within the transportation sector. A holistic approach, combining technological advancement, infrastructure development, and sustainable practices, will propel economic progress and contribute to the sector's overall development. Cambodia's journey toward economic prosperity hinges on leveraging the strengths of its service sectors, with transportation at its core, to navigate the challenges and seize the opportunities that lie ahead.

The limitations of this qualitative study provide opportunities for further research. Our limitations in key informant interviews and the absence of field surveys provide scope for the future. Also, examining stronger connectivity between transportation and sectors such as the tourism industry, textile industry, and agriculture would offer new insights for policy decisions.

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PART II

COVID-19: The Society and Education, and Government Interventions

CHAPTER 10

Guard against COVID-19: Predicting Young People's Pro-Society Actions, the Theory of Planned Behavior

Nicolson Yat-Fan Siu and Helena Ng

1. INTRODUCTION

Since the outbreak of COVID-19 (also known as SARS-CoV-2), declared by the World Health Organization (WHO) as a global pandemic on March 11, 2020 (Mao *et al.*, 2021), its impact on people has been intense and unprecedented. Besides the social and economic effects, the lifestyle of individuals in many countries became constricted in many ways. The spreading prevalence of the virus prompted the dire need for governments to reduce the mobility and interaction of individuals who traveled from one place to another, internationally or locally (Das *et al.*, 2021). International travel was limited as borders were closed, and mandatory quarantine obligations rendered cross-border travel inconvenient and less desirable. Some regions implemented lockdowns and banned the sale of alcohol. Indoor commercial and community amenities were closed; classroom learning, academic and non-academic, shifted to online mode. Overall, individuals' daily routines and ways of relating with family and friends have been markedly affected (Alex *et al.*, 2021). This COVID-19 pandemic lingers for two years. Clinically tested and approved vaccines were available earlier than the forecast of the United States' public officials (Adiyoso & Wilopo, 2021). By mid-December 2020, the first report of the vaccination information was published (Mathieu *et al.*, 2021). Based on the data provided by The New York Times (Holder, December 19), 58.3 percent of people across the globe have received their first COVID-19 vaccination. Despite high vaccination coverage, COVID-19 cases continue to escalate in many countries. The exponential rate of transmission of the epidemic suggests the uncertainty of the date and way this pandemic will end. Medical experts indicate hastening the universalization of vaccination, raising the coverage rate, and continuing to put into effect preventive measures to thwart and decelerate transmission rates (Adiyoso & Wilopo, 2021; Bian *et al.*, 2021). Owing to the intricate and variable nature of the viruses, more time and cooperative efforts are needed to explore effective medicines to bring a close to the

spread. On a positive note, it is within human power to manage the spread of infections if individuals withhold some of their free will for the greater good (Jetten *et al.*, 2020). Nonpharmaceutical interventions (NPIs) such as maintaining a distance of at least a meter from others, avoiding crowded areas, mandating face masks, staying home more, and frequently washing hands with soap and water or alcohol-based sanitizers are effective means of lowering the risk of contamination (Gibson *et al.*, 2021). Therefore, a pro-society frame of mind is necessary to practice such a health-conscious modus operandi.

In Hong Kong, a city with close to 7.51 million people (in mid-2019) living in a land area of 1,110.18 square kilometers (GovHK, 2021), the risk of virus transmission is relatively higher than in low-density places. In December 2020, when the first COVID-19 case was detected in Wuhan, China, Hong Kong citizens were vastly overwhelmed. The traffic flow between Hong Kong and China, by air, sea, and land, was high due to the multifaceted levels of business and social connections between the two places. Learning from the experience of dealing with the SARS pandemic in 2003, the government declared a virus emergency on January 25 (less than a month after the first coronavirus case was reported in Hebei Province in China). Travelers from this province were prohibited from entering Hong Kong, and mainstream borders between Hong Kong and China were blocked. At the same time, the government put stringent measures into place to safeguard its citizens' health (Ho & Chan, 2021). After a few months, Hong Kong achieved interim success in pandemic management. This triumph could not have happened without civil society's efforts and self-disciplinary actions (Wan *et al.*, 2020). For instance, in February 2020, the demand for face masks skyrocketed over its supply. Eyeing this crisis, a team of Hong Kongers took the lead in locally producing surgical face masks (Yiu, 2020) and selling them reasonably. During the trying time, citizens were conscientious in observing the social distancing, sanitizing, face mask-wearing, and other pertinent measures. People's pro-society behaviors cannot be taken for granted. A study conducted in the United States and Canada on attitudes toward wearing face masks during the COVID-19 pandemic showed that 16 percent of the 2,078 participants expressed reluctance to wear face masks as they perceived them as ineffective and felt being coerced into doing so (Taylor & Asmundson, 2021). Hong Kong people's united efforts exemplify Maaravi *et al.*'s (2021) argument that "cultural dimensions may also play a role in explaining the differential effect of the pandemic" (p. 2). People in Hong Kong take to heart the critical need to protect the health of others and themselves. Citizens have become considerably accustomed to the precautionary regimes more than a year into the Coronavirus. Despite this phenomenon, it is worth mentioning that the desire to observe the COVID-19 pandemic measures differs among individuals, as personal traits and self-oriented types of pandemic-related worries can inform such differences (Tabaczel & Kozlowska, 2021). Approved

vaccines have been rolled out; however, concerted NPI efforts to combat the pandemic are crucial. It is timely to look in-depth at the determinants of people's behavior. Knowing the contributing factors is germane to the design of social policies that inform actions that serve the best interest of society. The present chapter hinges on the Theory of Planned Behavior (TPB), investigating the intentions to engage in pro-society behavior as a support to overcome the Coronavirus in a representative sample of the population of university students in Hong Kong.

2. LITERATURE REVIEW

The TPB is a well-established behavioral model developed by Icek Ajzen, whose article, "From Intentions to Actions: A Theory of Planned Behavior," published in 1985, shows that human behavior is determined by intention, and three factors form the determinants. Essentially, attitude, subjective norms, and perceived behavioral control influence behavior (Ajzen, 1991; Lehberger *et al.*, 2021). Based on the TPB model, attitude encompasses individuals' overall assessment of their behavior as positive or negative (Albarracin *et al.*, 2001; Beck & Ajzen, 1991; Kim & Han, 2010). Subjective norm refers to societal tensions that have a role in individuals' decision to take or not take an action (LaMorte, 2019). Perceived behavioral control represents individuals' evaluation of the action they are about to take as easy or difficult (as cited in Martin, 2017). The TPB model is widely used to predict and explain human behavior (Abou-Zeid & Ben-Akiva, 2011; Ajzen, 1985; Ajzen, 1991; Catalano *et al.*, 2017; Frounfelker, 2021; Jalilvand, 2012; Kim & Han, 2010; Wang *et al.*, 2014), and is arguably the most often cited framework that enhances understanding of the fundamentals of human behavior (Sussman & Gifford, 2019).

Since the outbreak of the COVID-19 pandemic, empirical studies on a constellation of health behaviors are on the rise (e.g., Bourassa *et al.*, 2020; Maykrantz *et al.*, 2021; Taylor & Asmundson, 2021). There is a substantial body of research on individuals' behaviors using the TPB model (Adiyoso & Wilopo, 2021; Cobanoglu & Corte, 2021; Das *et al.*, 2021; Gibson *et al.*, 2021; Godbersen, 2020; Irfan *et al.*, 2021; Lehberger *et al.*, 2021; Mao *et al.*, 2021; Shmueli, 2021; Wolff, 2021; Trifiletti *et al.*, 2021; Yu *et al.*, 2021). Researchers have targeted people's consumption behavior in the business and hospitality sectors using the TPB model (Han *et al.*, 2020; Lehberger, 2021; Liu *et al.*, 2021; Youn *et al.*, 2021). In medicine, one study borrowed the TPB model to examine medical doctors' perseverance in professional competence (Wiese *et al.*, 2021). In social science, many researchers used the TPB model to investigate COVID-19 prevention efforts (Frounfelker, 2021; Gibson *et al.*, 2021; Godbersen *et al.*, 2020). In China, a team of scholars has explored the commitments of its residents to engage in preventive behavior to enhance public health outcomes (Mao *et al.*, 2021). Some studies focused on the preventive behaviors

of young people (Gabriel *et al.*, 2021; Ullah *et al.*, 2021). One research targeted higher education systems in predicting students' COVID-19 safety behavior (Li *et al.*, 2021). So far, little is known about the intention of young people in Hong Kong to engage in preventive measures. Against this backdrop, this study investigated the behavioral intentions of individuals enrolled in higher educational institutions to engage in pro-society actions that contribute to the uptake of preventive behavior. Specifically, the three key constructs of the TPB (attitude, social norm, and perceived behavioral control) were examined using the Goodness-of-Fit statistics (Ritter & Muñoz-Carpena, 2013) to comprehend the level that these factors influence the behavioral intention of the university students. Findings also help to inform society of essential strategies for coping with future outbreaks.

3. THEORETICAL FRAMEWORK AND RESEARCH HYPOTHESIS

Theory is central to explaining a broad scope of human behavior and provides a vital structure that promotes enhancement in health-related behaviors (Prestwich *et al.*, 2015). Ajzen's TPB model has earned credit for successfully predicting various health behaviors (Lin *et al.*, 2018; Xiao & Wong, 2020). This theory applies to multiple industries and fields. The model presumes that three social cognitive factors are positively related to behavioral intention, which impacts engagement in specific behavior (Frounfreiker *et al.*, 2021; Ullah *et al.*, 2021). The stronger individuals' attitudes, subjective norms, and perceived behavioral control toward a specific behavior, the higher the likelihood these individuals intend to carry out the behavior. In the context of this study, the attitude, social norms, and perceived behavioral control of university students to comply with the precautionary measures to help curb the spread of the COVID-19 pandemic were investigated. Attitude refers to participants' mental appraisal of their supportive action (complying with COVID-19 prevention measures) as favorable or unfavorable. Presupposition cannot be made that everyone sees support of the public health measures as advantageous. For example, during the third week of April 2020, a survey in the United States revealed that 15% of respondents refused to engage in preventive measures (Adiyoso & Wilopo, 2021). The social norm in this study is about individuals' stronger intention to adopt the set of protective measures of personal hygiene, being careful about touching eyes, mouth, and nose, frequent hand washing, wearing face masks when in public areas, social distancing, and using the "leave home safe" mobile app in response to their feeling of the social pressure. For example, they may feel stressed about whether their family, friends, and colleagues should observe those measures. Perceived behavioral control refers to their perceptions of the extent of resources and self-efficacy, such as vigilance of their hygiene practice, availability of face masks, and ability to download the mobile app. The more they see their ability to comply with these measures, the

higher the likelihood of carrying out such behavior (Axsen & Kurani, 2013). The three factors would have a direct impact on participants' behavior intention toward the uptake of the pro-society behavior. As Ajzen (1991) articulates, "the relative importance of attitude, subjective norm, and perceived behavioral control in the prediction of intention is expected to vary across behaviours and situations" (p. 188). Uncovering the weight of the three constructs is critical, as they relate to participants' pro-society actions to help reduce the spread of the Coronavirus. Findings would elucidate the power of each of the constructs as predictors of behavior.

This study aimed to understand university students' intention to comply with preventive measures based on the TPB. It is hypothesized that attitude, subjective norm, and perceived behavioral control would collectively predict intention to engage in preventive measures to guard against the spread of COVID-19. That, in turn, the intention would predict the uptake of the actual behavior of the COVID-19 pro-society action.

4. METHODS

4.1 Participants

Three hundred and seven undergraduate students from universities in Hong Kong participated in the study voluntarily with informed consent. The sample consisted of 165 men and 142 women, with a mean age of 19.6 (SD = 3.61). They all reported that they had not been infected with COVID-19, and none of their family or friends had been infected. The majority of them were enrolled in the bachelor's degree program in social sciences (89.91 percent), while the rest were in medicine (1.95 percent), science (2.28 percent), and business (5.86 percent) programs. They were mainly agnostics (86.32 percent), while some were Christians (11.73 percent), and others were Buddhists (1.95 percent).

4.2 Measures

The questionnaire included demographic questions, measures of attitude, subjective norms and perceived behavioral control, behavior intention to engage in preventive measures to guard against the spread of COVID-19, and the actual implementation of the behavior. Demographic information, such as age, gender, educational level, and religion, was collected. Regarding the TPB measures, items were developed based on Ajzen's (2010) guidelines. All items were measured on a 7-point bipolar scale. Prosocial behaviors to reduce infection and spread of COVID-19 were defined as maintaining good personal hygiene and immunity, avoiding touching one's eyes, mouth, and nose, frequent hand washing, taking body temperature regularly, wearing face masks in public areas, maintaining social distance, and using Mobile App (to

support retail outlets to gauge persons who have been diagnosed have visited the same place at the same time). Participants were then asked to report their attitude, subject norms, perceived behavioral control, and behavioral intention towards prosocial behaviors to reduce infection and spread of COVID-19. Each construct had four semantic differentials, including cognitive and affective evaluations. Scores were averaged to measure attitude, subject norms, perceived behavioral control, and behavioral intention. Concerning the measure for implementing the pro-societal action against COVID-19, participants were asked about the frequency of their practice of each behavior against an 8-point scale, from 0, not at all, to 7, practice every day. Each behavior was assessed with one ad-hoc item.

4.3 Procedures

Participants were recruited from the online platform Qualtrics (https://www.qualtrics.com) using a convenient sampling technique, and their eligibility to participate was assessed (i.e., if they were undergraduate students residing in Hong Kong at the time of this study, and they had not been infected with COVID-19). They were asked to sign an informed consent online and complete an anonymous survey assessing their beliefs and behaviors on pro-society actions to guard against COVID-19.

5. EMPIRICAL RESULTS

A regression model for predicting the implementation of pro-societal actions to guard against COVID-19 was tested with R (Sheather, 2009). In the model, attitude, subjective norm, and perceived behavioral control were entered as predictors of behavioral intention, and behavioral intention, in turn, was entered as the predictor of the pro-societal actions to guard against COVID-19 which was the outcome variable. The goodness-of-fit of the test models was evaluated using the chi-square statistics (χ^2), the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root-mean-square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR) (Hu & Bentler, 1999).

The regression model is shown in Figure 10.1. Goodness-of-fit statistics were satisfactory for the model, including the pro-societal actions to guard against COVID-19 as the outcome variable, $\chi^2 = 717.274$, $p < .001$; CFI = .997; TLI = 1.000; SRMR = .001; RMSEA = .001). As can be seen in Figure 10.1, attitude ($b = 0.519$, $p < .001$) and subjective norm ($b = 0.255$, $p < .001$) were significant predictors of behavioral intention, with attitude being a robust predictor. Behavioral intention, in turn, significantly predicted the pro-societal actions to guard against COVID-19 ($b = 0.808$, $p < .001$). Nevertheless, perceived the path from behavioral control to behavioral intention was insignificant ($b = 0.014$, $p = 0.628$).

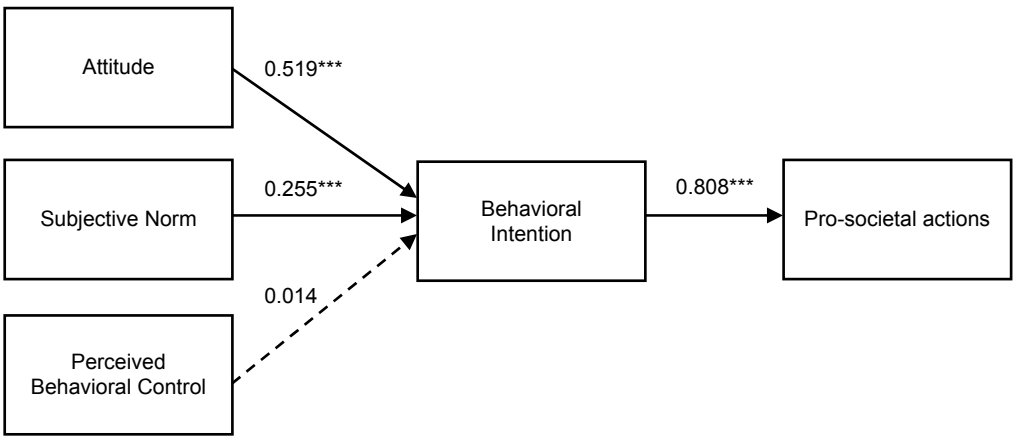

Figure 10.1: Regression Model Predicting the Implementation of the Pro-societal Actions to Guard against COVID-19

Note: The standardized coefficients are reported. The dotted arrow indicates a non-significant path, and *** indicates *p*-value < .01.

6. DISCUSSION

The health emergency brought about by COVID-19 has aroused public awareness of the critical role of human behavior in controlling the spread of epidemics (Michie & West, 2020; Trifiletti *et al.*, 2021). Pro-societal actions, such as taking care of personal hygiene, avoiding touching the eyes, mouth, and nose, frequent hand washing, wearing masks in public places, social distancing, and using Mobile Apps are profound ways to prevent the pandemic situation from worsening, at least in the absence of a vaccine or treatment that is 100 percent effective. Therefore, it is crucial to understand the factors underlying the enactment of helpful pro-society actions to guard against COVID-19. Also, because of the rebound of the epidemic caused by the Delta and the Omicron variants, experts in the field of public health reinstate the importance of keeping up with the compliance of relevant preventive measures. The present study showed some crucial findings on TPB constructs in predicting pro-society actions. Counter to our hypotheses, only attitude and subjective norm of the TPB constructs are significant predictors of pro-society actions. At the same time, the influence of perceived behavioral control is less strong than posited. It may sound straightforward to think that human perception of their ability to control their behavior would increase or decrease the chance of their engagement; this may not always be the case. Owing to the life-threatening phenomenon of the COVID-19 pandemic, regardless of some difficulty in performing pro-society actions, individuals are inclined to try their best to commit (Ajzen, 2002). Besides, engaging in these pro-society actions reflects individuals' responsibility for society rather than for themselves. Hence, an

individual's perception that the target behavior is easy or challenging to perform has a lesser role in predicting the uptake of pro-society actions.

Different associations of TPB constructs with intentions to engage in pro-society actions also warrant attention. Attitude exerted a more significant influence than the subjective norm on predicting behavioral intention. Consistent with previous findings in the literature, subjective norm has been regarded as the weaker element of TPB because of its predictive power. A meta-analysis also showed that the average relationship between subjective norms and behavioral intentions was weaker than the relationship between the other constructs and intentions (Armitage & Conner, 2001). Another possible explanation is that the different effects of social norms on behavior may rely on the perceived and objective costs related to implementing the behaviors. Previous studies have suggested that more costly behaviors for a person will be less dependent on normative influence (Chung & Rimal, 2016). In this regard, pro-society actions are behaviors that are perceived as easy to be carried out. Therefore, attitude becomes a more dominant factor in predicting the uptake of pro-society actions.

In contexts where attitude and subjective norms are powerful predictors of pro-society actions, the influence of perceived behavioral control is not significant. It is vitally essential to indoctrinate a positive attitude on all pro-society actions, including personal hygiene, avoiding touching the eyes, mouth, and nose, frequent hand washing, wearing face masks in public places, social distancing, and using the Mobile App. Providing adequate understanding and knowledge on how these measures help safeguard against COVID-19 in the community is crucial. Preventive campaigns and promoting pro-society behaviors should consider the importance of nurturing positive attitudes and harnessing social norms among the public.

Raising awareness of the factors that lead to pro-society behaviors against COVID-19 is critical to informing the government about this topic and providing the public with precise and updated information, which will ultimately benefit relevant stakeholders in the community amid COVID-19. Concerning future investigation, since the present study sample consisted mainly of undergraduate students from the faculty of social sciences, further research should include participants with different backgrounds and developmental stages to enhance understanding of the factors that predict pro-society behaviors against COVID-19. Second, although TPB offers a significant understanding of how people will uptake a particular behavior, it does not directly consider arousal or emotional factors, which suggests that the TPB may be restricted to the rational part of a decision (Conner & Norman, 2005). Therefore, apart from studying the constructs from TPB, the impact of emotion and risk perception on the pandemic situation in predicting pro-society behaviors should also be investigated. Several other models, like the Health Belief Model and Protection

Motivation Theory, can provide a framework to investigate further the role of emotion and threat in predicting individuals engaging in pro-society behavior to guard against COVID-19.

7. CONCLUSIONS

A crisis, albeit overwhelming and devastating, is an opportunity in disguise. As the public health crisis looms, taken-for-granted perspectives of life have proven impractical, and people must temper modes of operation for survival and growth. The disastrous and far-reaching effects of the Coronavirus are concerns of national health providers, policymakers, medical experts, researchers, and scholars (Das *et al.*, 2021). This study can serve as a valuable addition to the literature, as it examines the underlying factors of behavioral intentions of university students' uptake of COVID-19 precautionary measures, especially in a densely populated city like Hong Kong. Further, gathering information and awareness of the factors that lead to implementing pro-society actions is crucial to provide a comprehensive overview of the impact of antecedents on individuals' compliance with different pro-societal actions. Such actions will inform scholars and government officials and benefit society at large.

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CHAPTER 11

Effects of COVID-19 on Students' Families and their Coping Mechanisms: Implications on School's Resilience

Juliet C. Uy

1. INTRODUCTION

Many households worldwide suffered economic distress brought about by the prolonged COVID-19 pandemic. The wave of this plague has inflicted misery mostly on low-income families, particularly in countries where governments are less able to provide adequate social amelioration support to their constituents. The World Bank and UNICEF joint report (2022) revealed that "at least two-thirds of households with children have lost income since the COVID-19 pandemic hit two years ago." A report from the University of Michigan showed that because of the COVID-19 pandemic, low-income households are least likely to send their children to school (Mostafavi, 2020). According to Kakuchi (2021), Universities in Japan reported a decrease in new and ongoing student enrolment due to the impact of the COVID-19 pandemic on families' economic conditions and students' mental health. The leading reasons reported are students' difficulty paying the tuition fees and lack of motivation while forced to study online at home.

The pandemic's negative impact on families' finances forced some U.S. students to sacrifice college, while one in four high school graduates postponed their college plans (Dickler, 2021). Feuer (2020) cited the executive director of the United Nations Children's Fund as saying that "at least 24 million children are projected to drop out of school due to COVID-19."

Save the Children Cambodia reported that "students in households where the head of the household could not continue in the same job as before the pandemic were exposed to a dropout risk of about 5.3 percent higher than students staying in households where the head of the household could continue in the same job as before the pandemic" (Cheb, 2021). The World Vision survey on the impact of COVID-19 on vulnerable households showed that the pandemic has reduced the income of 95 percent of households in Phnom Penh and 70 percent of households in the provinces (World Vision, 2021). Based on 2019 data, there were 3,636,100 households in

Cambodia, and 531,600 (15 percent) live in Phnom Penh (CEIC Data 2021). These households have been adversely affected by the pandemic in various ways. The enormous financial constraints on families inevitably impacted academic institutions as the parents and students are their primary stakeholders and the main source of the revenue stream sustaining their operations.

Dara (Phnom Penh Post, January 19, 2021) reported that enrollment in higher education institutions in the new academic year has decreased compared to the previous years due to the COVID-19 pandemic. The Cambodian Higher Education Association (CHEA) chairman said that students across all private universities had stopped paying tuition fees since the COVID-19 outbreak. Only 40 percent of students at Vanda Institute resumed their studies for the new academic year. But how about the students at another leading business school- CamEd Business School? Is not sending the children back to school one of their parents' coping mechanisms? How does this coping mechanism affect the school's resilience during this pandemic-induced financial crisis?

This chapter aims to determine the effects of the COVID-19 pandemic on students' families and their coping mechanisms during this health and financial crisis. Specifically, it seeks to find out the following:

1. The profile of the families of the student respondents in terms of the number of family members, the family breadwinners, the number of family members attending school, and the sources of family income before the pandemic;
2. The effects of the pandemic on employment and family businesses, children's school attendance, family exposure to COVID-19 disease, changes in household income, savings, borrowing, and spending;
3. The psychological effects of the pandemic experienced by the students;
4. The coping mechanisms of the families during these difficult times; and
5. The decision to send children back to school (as one of the common coping mechanisms of parents) and its implications for the school's resilience.

The chapter's following section reviews the empirical studies in this direction. Following this, the chapter discusses the methodology used in this study. Subsequent sections present the empirical results and discussions, followed by the conclusion and recommendations.

2. LITERATURE REVIEW

2.1 Effects of the Pandemic on Employment and Family Businesses

The effects of the pandemic on employment and family business are pervasive. Disparte and Tillemann (2020) reported that one in four American workers has filed

for unemployment protection in just three months since the crisis began. As stated by Mayai *et al.* (2020), the COVID-19 pandemic has affected both the public and private sectors in South Sudan. Both sectors experienced declining employment and wages as many businesses laid off workers due to reduced operations and/or closed down. Kelly (2020) cited the U.S. Chamber of Commerce report that 20 percent of small businesses have temporarily closed down since the pandemic started. The pandemic has forced enterprises to adopt technology to do business online, but their online sales cannot compensate for the closure of their physical stores.

Since March 2020, Cambodia has imposed entry restrictions for all foreign travelers (Xinhua, 2021). Consequently, tourism has been one of the most affected sectors by the pandemic as travel restrictions have been implemented (B2B Cambodia, 2020). It was reported that 90 percent of MSMEs suffered a decline in revenue because of the pandemic. Most reported a 50 percent drop in revenue, and some reported no revenue. In response to this crisis, 12 percent of the MSMEs adopted a new business model, such as using online markets or social media to reach their customers, working from home, or providing home delivery services. However, only 8 percent reported to have generated more revenue than before the pandemic (The Asia Foundation, 2020). Most private businesses in Cambodia are small and medium; many are family-run, of which women own 65 percent. A survey by the Cambodia Women Entrepreneurs Association (CWEA) in 2020 shows that 59 percent of women-owned businesses were affected by the pandemic, out of which 17 percent of the businesses were closed (Seng, 2020).

2.2 Changes in Household Spending

The loss of income has tremendously affected household spending. The aggregate data from countries in the eurozone show that in the year 2020, household spending dropped by 7 percent compared with the year 2019. The drop is higher in three countries, 6.1 percent in France, 8.9 percent in Italy, and 10.9 percent in Spain (Christelis *et al.*, 2021). In another study, Kenny *et al.* (2021) mentioned that many writers have conducted several studies to investigate the consumption effect of the COVID-19 pandemic in the U.S. and European countries. However, they rely primarily on administrative data rather than a household-specific evaluation that can capture the wide-ranging effects of the pandemic among different households. Their recent study covering 10,000 households across Europe looks at the degree of financial concerns about the financial consequences of the pandemic. The results show that lower-income households and those experiencing liquidity constraints feel high financial concerns. The consumption of non-durable goods dropped by 25 percent among households who are very concerned compared to those who are least concerned. This, however, excludes other variables that may affect household consumption.

The survey of 451 Research's Voice of the Customer Macroeconomic Outlook, Consumer Spending of North American consumers shows that 75 percent of the respondents reported that their spending on eating out and leisure travel has declined, and about 30 percent said that their spending on consumer electronics would decrease (Bitter, 2020). Demand for non-essential goods and discretionary items in India has dropped by 50 percent due to COVID-19 restrictions. As a result, businesses are worried as they confront huge losses (India Today, 2021).

Brancaccio *et al.* (2020) reported that more expenses are incurred when studying from home due to the pandemic. Households that do not have internet or better connections need technology upgrades. Additionally, households with more children studying need more devices as well. The financial cost of online learning, however, is not the same in all households. Based on one analyst, millennial parents are affected most as they are most likely to have school-aged children. According to Brenneman (2020), the survey of 1,971 families with children in K-12 in Los Angeles schools revealed that "families have made great sacrifices to invest in digital infrastructure, with the highest spending on fixed Internet followed by laptops and computers. Digital readiness at home is key to supporting live instruction models, which in turn affect schoolwork completion and student motivation."

The survey of World Vision Cambodia (2021) among households within their program areas revealed that only 46 percent of the households in Phnom Penh can fully cover their expenses for food, while 50 percent in the provinces. To cope with the impact of the pandemic, 38 percent of households reduce their spending on food, 37 percent take on more debts, and 36 percent spend their savings. The World Bank's (2020) monitoring shows that the households in rural and urban areas of Cambodia suffered a reduction of income from all sources due to the pandemic, and to cope with the income losses, they have reduced food and non-food spending.

2.3 Psychological Effects of the Pandemic Experienced by the Students

The results of the survey with students at a large public university in the United States showed that 71 percent of the respondents reported increased stress and anxiety due to the COVID-19 pandemic. The contributing stressors were fear and worry about their health and their loved ones, difficulty concentrating, disruptions to sleeping patterns, and decreased social interactions due to physical distancing (Son *et al.*, 2020).

The cross-sectional study by Browning *et al.* (2021) found that the risk factors for higher levels of psychological impact during the COVID-19 pandemic among college students in the United States were being a woman, being of younger age (18–24 years old), experiencing poor/fair general health, spending eight hours extensive

time on screens daily, and knowing someone infected with COVID-19. The study concluded that "inadequate efforts to recognize and address college students' mental health challenges, especially during a pandemic, could have long-term consequences on their health and education."

A survey in Cambodia shows that the mental health of adults and children also deteriorated during the pandemic, where 80 percent of the adult respondents feel more hopeless, depressed, and stressed than before the start of the pandemic. More than 70 percent of the children felt more angry, afraid, and hopeless since the beginning of the COVID-19 pandemic (World Vision Cambodia, 2021).

2.4 Households' Coping Mechanisms during the COVID-19 Crisis

Chowdhury (2019) mentioned that support systems or social support are among the positive coping strategies. As cited by Chowdhury (2019), Lazarus and Folkman defined a support system as "having someone to take your back during tough times," which can help people overcome stress more efficiently. The study by Adesina-Uthman and Obaka (2020) on how households coped with the COVID-19-induced lockdown in Nigeria showed that the most preferred coping strategy was to take salary advance followed by going back to work. Other coping strategies include borrowing essential supplies from families and friends and selling personal assets. The least adopted coping strategy is lending from banks.

Households in Cambodia resorted to drastic coping mechanisms such as reducing spending on education and health, selling productive assets, and sending family members to look for work in other provinces (UNICEF Cambodia, 2021). Human Rights Watch (2021) reported that the Cambodian government on May 11, 2021, through its "emergency social assistance program," provided one-time cash transfers to low-income families affected by COVID-19 lockdowns and with members who were infected or who died due to the pandemic. However, according to the Asia director of Human Rights Watch, the government's one-off cash transfer will not address people's basic needs. It also cited the UN-led study in April, which showed that "in the last six months, households have increasingly adopted coping strategies to access food including reducing food intake, relying on cheaper options, and borrowing." The survey conducted in three provinces and Phnom Penh by World Vision Cambodia (2021) mentioned the different coping mechanisms used by the respondents to deal with their reduced income during the pandemic. It was reported that 70 percent of the respondents rely on less preferred, less expensive food, 50 percent reduced the portion size of their meals, 34 percent reduced the number of meals eaten daily, and 25 percent reduced the quantities consumed by adults or caregivers.

3. STUDY METHODOLOGY

The respondents of this study were 188 students out of a total of 236 second-year students of CamEd Business School who studied Business and Technology course in January-June 2021. CamEd Business School is a higher educational institution in Phnom Penh, Cambodia, offering Bachelor of Accounting and Finance and Professional Certification Programs such as Certified Accounting Technician (CAT) and Association of Chartered Certified Accountants (ACCA). Participation in this study was voluntary, and 48 students did not participate, as 17 had stopped attending school, and 31 did not respond. The Business and Technology course covers the business environment and microeconomics topics, particularly commodities responsive to household income changes.

The primary data were collected using a questionnaire prepared in Google Forms. The link to the questionnaire was sent to the target students. The respondents were requested to complete the questionnaire and interview their parents or other household members about other questions they may be unable to answer. The questionnaire has five sections: household profile; effects of COVID-19 on family businesses and employment, health, and education of family members; changes in household finances during the pandemic; the psychological impact of COVID-19 on students; and the coping mechanisms of their families during the pandemic. The study used secondary data collected from CamEd Business School. Finally, the study used descriptive statistics to analyze the data.

4. EMPIRICAL FINDINGS

4.1 Profile of Surveyed Families

The data shows that the family size of the respondents varies. Most families had four to six members. The breakdown indicates that 3.2 percent and 8.0 percent of families had two and three members, respectively. In contrast, nearly one-third (32.4 percent) of respondents had four members in their families, 29.3 percent had five members, and 27.1 percent of families had six or more members.

As far as the number of family members who are breadwinners is concerned, more than half (53.2 percent) of the families had both parents as breadwinners. However, a few families had only a father (34.0 percent) or a mother (11.2 percent) as the income earner. In addition, a meager percentage of families (1.1 percent) breadwinners were the respondents' brother/sister and grandfather/grandmother.

Among students who responded (n = 185) when asked about the sources of their family income, almost half (45.9 percent) of their families derive their income from family businesses. In comparison, nearly the same number of families (47.0 percent)

rely on parents' employment in the public or private sector. Property rental was another source of income for the respondents' families (2.7 percent).

In terms of the number of family members attending school, it is revealed that while less than one-tenth (7.4 percent) of respondents' families had four or more children studying, above one-third (38.3 percent), families had two children, 32.0 percent had three children, and 22.3 percent had only one child attending school.

The analysis of the responses shows that out of 188 families, 26 percent reported having children who stopped studying in other schools due to the pandemic. These are the families with more than one child attending school. Of the 49 households, 47 percent were sending three to four children to school, and 41 percent were sending two children to school.

The data in Table 11.1 shows that families with more income earners were least likely to have children who stopped attending school during the pandemic. Of the 188 families, 52 (27.7 percent) had only one member earning for the family. This group had the highest percentage (31 percent) of children who stopped attending school. For families with two income earners, 26 percent reported having children who quit school. Of those with three income earners, 20 percent had children who stopped attending school, while for those with four or more income earners, only 18 percent had children who left school due to the pandemic.

Table 11.1: Number of Income Earners Per Household and Children Who Stopped School

Number of income earners per household	*f*	*%*	*Number of families with child/children who stopped attending school due to the pandemic*	*The proportion of households with a child who stopped attending school with regards to the number of earners per household*
One	52	27.7	16	31%
Two	100	53.2	26	26%
Three	25	13.3	5	20%
Four or more	11	5.9	2	18%
Total	**188**	**100.0**	**49**	**26%**

4.2 Effects of the COVID-19 Pandemic on Surveyed Families

Effects of COVID-19 on Employment and Family Business

The respondents reported that their household income was affected by the COVID-19 pandemic in various ways. The results show that among 182 reported respondents,

7.0 percent of them had a father who lost employment during the pandemic. Those with mothers who lost a job were twice in percentage. This result implies that the COVID-19 pandemic caused the displacement of more women workers among the surveyed families. In addition, 48 percent of respondents reported that their father and 37 percent of respondents' mothers continued to work with reduced pay. Those households that owned a business were also affected: 40 percent reported that their business was temporarily closed, while 8 percent had a permanently closed business.

Effects of COVID-19 on Children's School Attendance and Family Exposure to the Virus

The study shows that 26 percent of respondents reported having a sibling who stopped attending school, 14 percent said they have a sibling who transferred to another school with a cheaper tuition fee, and 9 percent stated that they have a sibling who shifted to another course. Among 188 students, 82 percent indicated their determination to complete their studies despite the pandemic. Regarding family exposure to COVID-19, seven respondents reported having a family member infected by the virus but recovered. However, one of them had a family member who died due to the infection. A total of six respondents reported having lost a family member to this deadly virus. The school records show that the six respondents and a family member who succumbed to COVID-19 lived in Phnom Penh City, where the school is located. The shift from hybrid class meetings to a fully online class was sensible to prevent the spread of the virus in school.

Effects of COVID-19 on Household Income, Savings, Borrowing, and Spending

Figure 11.1 shows that out of 188 families, 86 reported having experienced a significant decrease in family income, 73 reported a slight decline in income, 17 indicated no change in income, and only two said their family income increased slightly. Of the 86 families who had a significant decrease in income, 44 own a family business, 25 derived incomes from employment in the public sector, seven from jobs in the private sector, two from the income of a sibling, one from farm income, three from the property rental, and another four from various income sources. The 44 families who derived income from family businesses suffered a significant reduction in income as 31 of them had closed their businesses temporarily, and seven had closed permanently. Of the 73 families that experienced a slight decrease in income, 31 were engaged in business, 25 derived income from employment in the public sector, 13 from jobs in the private sector, and others from farm income, property rental, and other sources. It can be deduced that a reduction in household income (whether significantly or slightly) was experienced by 88 percent of those operating a family

business, 87 percent of those employed in the private sector, and 78 percent of those employed in the public sector. In general, eight of every ten families suffered a reduction in family income during the pandemic.

The study further reveals that family savings dropped due to the pandemic. Forty-two respondents reported a significant decrease in savings, while 59 had a slight decrease. Forty-two respondents declared their family savings remained the same, 11 had a slight increase, and five declared to have a significant increase. These five households with a substantial increase in savings were engaged in business, and their company did not close. Two of them sold a property, while two took loans from the bank.

The study also reveals that family borrowing increased significantly, as reported by 15 respondents, and rose only slightly, as stated by 24 respondents. Sixty-eight respondents said their family borrowing was the same, and 66 were unsure. Seven respondents revealed that their family borrowings decreased because their business did not close; one sold a property, one spent their savings, and two families asked their children to stop attending school.

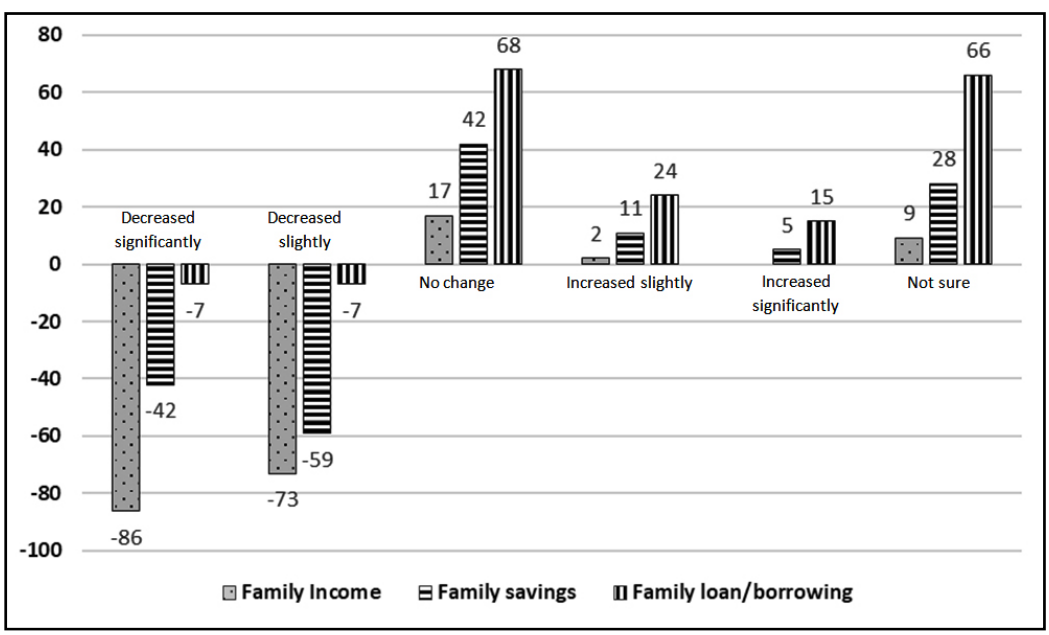

Figure 11.1: Changes in Family Income, Savings and Borrowing

Household spending on basic needs such as food, electricity, and water increased except for clothing. The data in Figure 11.2 shows that spending on electricity increased significantly, as 58 percent of the respondents reported. This is followed by

spending on water (33 percent) and food (29 percent). Nine respondents said that their spending on food decreased significantly, and 29 reported only a slight decrease. One respondent mentioned, "We have difficulty in buying food and other stuff because of reduced salary, so we have to spend less every day," and another respondent stated, "Our family income has reduced by about 60 percent but we spent more than before for electricity, water, wi-fi and food as well." Spending on clothing dropped significantly, as reported by 35 percent, and decreased slightly, as stated by 20 percent of the respondents.

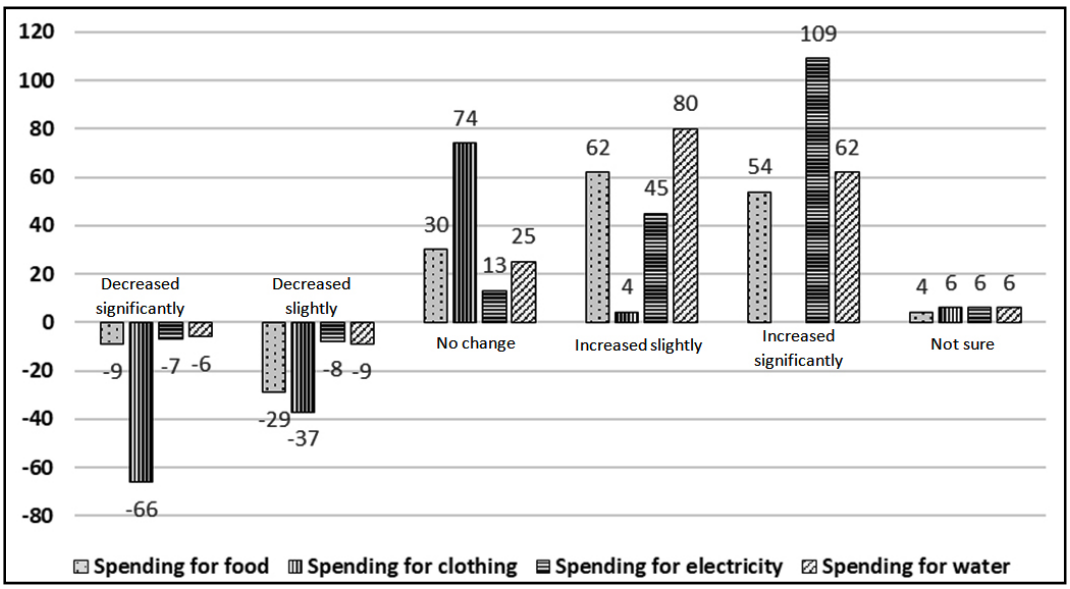

Figure 11.2: Changes in Spending on Basic Needs

The data in Figure 11.3 indicates that expenses for the Internet/wi-fi increased significantly, as reported by 39 percent of the respondents. One respondent mentioned, "Spending at home, especially for wi-fi increased significantly as we use more electronic devices for working from home and studying from home." As indicated by 31 percent of the respondents, spending on education also increased, as many of them have invested in technology to study from home. This result conforms with the study of Brancaccio *et al.* (2020), which states that more expenses are incurred when studying from home due to the pandemic.

Spending on transportation decreased significantly among 31 percent of the respondents and slightly among almost the same proportion. However, three out of ten respondents said their spending on the Internet, medicines, transportation, and education stayed the same.

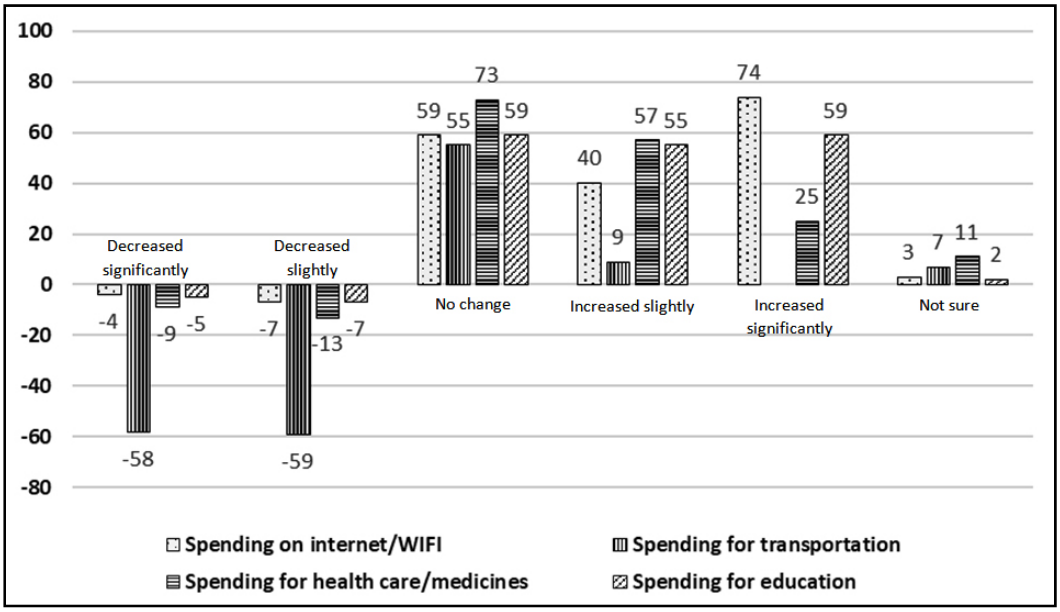

Figure 11.3: Changes in Spending on the Internet, Health Care, Transportation, and Education

The study shows that expenditures on travel and durable goods fell significantly. As 51 percent of the respondents indicated, spending on overseas holidays significantly decreased. This was the effect of the government's travel restrictions and flight cancellations. Expenses for recreation and domestic travel and spending on appliances and vehicles also dropped substantially. This result indicates that the pandemic mainly affected the business sector.

Psychological Effects of the Pandemic Experienced by Students

The respondents were asked about the psychological effects of the pandemic that they have experienced. Table 11.2 shows that the majority experienced stress (89 percent), lack of focus on their studies (82 percent), fear that their family will be infected by the virus (77 percent), and hopelessness (52 percent). These results corroborate the study of Son *et al.* (2020), where 71 percent of the students at a large public university in the United States reported increased stress and anxiety due to the COVID-19 pandemic. The survey of World Vision Cambodia (2021) also noted that the mental health of adults and children deteriorated during the pandemic, where 80 percent of the adult respondents felt more hopeless, depressed, and stressed.

One of the respondents said, "My parents are nurses, so they are still going out to perform their duties as medical staff. It worries us a lot about their health and safety." Many respondents worry that they cannot continue their studies (47 percent) and

that they may transfer to a less expensive school (32 percent), while some said that they may stop schooling and find a job to help their family (23 percent). Some respondents stated, "The COVID-19 pandemic caused a financial problem for my family. School fees and everything increased, and we struggled to meet our needs. I tried looking for a job to support my family, but no company wants new employees due to the pandemic. Another thing is that our neighbors are affected by the virus, and we are apprehensive that our family will have to face the same problem." "My family's earning capacity is affected as the crisis hits everyone and appears to be threatening the economy and the entire family, which is a worrying sign for my future education in CamEd." "We lost a lot of income, and our family business didn't do well. I took $1,500 out of my school fee and put it into my small online business, but I didn't get any income back due to the pandemic." "The COVID-19 lockdown with many infected cases and deaths gave everyone a hard time, including students. I believe that some people might not find it easy to get focused all the time during online classes. It would be nice if students often receive more positive encouragements/mental support from the school."

Table 11.2: Psychological Effects of the Pandemic Experienced by Students

Psychological Effects of the Pandemic	*f*	*Rank*
Stress	168	1st
Lack of focus on my studies	154	2nd
Fear that anyone in the family will get sick of COVID-19	144	3rd
Hopelessness	98	4th
Worry that I cannot continue my studies	89	5th
Worry that I may transfer to another school with lower tuition fees	60	6th
Worry that I may stop schooling and find a job to help my family	44	7th
Concern that I might shift to an IT course	9	8th

4.3 Coping Mechanisms of Families during the Pandemic

To cope with the effects of the COVID-19 pandemic, 83.5 percent of households opted to reduce spending on non-essential goods (Figure 11.4). This option ranks first among the coping mechanisms adopted by the families. These households were further classified according to whether their household income decreased significantly, decreased slightly, had no change, or increased somewhat, and not sure. The analysis of the data showed that 50 percent came from families whose income declined significantly, 34 percent came from the group whose income decreased

slightly, 10 percent from those whose income remained the same, and only 2 percent among those with a slight increase in family income (Table 11.3). This indicates that non-essential goods were more responsive to the change in household income. Hence, non-essential businesses were most likely faced massive losses during this pandemic. Those respondents who reported that their family income rose slightly had both parents engaged in business, and their company did not close. They also invested in technology to do business online.

Table 11.3: Households that Reduced Spending on Non-essential Goods during the Pandemic

Households that reduced spending on non-essential goods	***Household Income***	*f*	*%*
157 (84%)	Decreased significantly	79	50
	Decreased slightly	53	34
	No change	15	10
	Increased slightly	3	2
	Not sure	7	4
	Total	**157**	**100.0%**

Another coping mechanism for families was having a positive attitude during the crisis. This was the 2nd common coping mechanism preferred by seven out of ten respondents. Two respondents had these to say: "at this time of the pandemic, stay at home (especially, those who live in the red zone); practice the three do's and three don'ts protocols set by the government; only take note and listen to reliable information from the Ministry of Health; try to stay positive and absorb sunlight; meditate at least 10 to 15 minutes every morning; and always have a positive attitude and do things that make you happy." "No more family reunions, and we should not hang out like we used to. The business getting complicated because of the safety guidelines where there are many requirements we need to follow and we require to try harder to make the business stay stable despite the unstable circumstances."

Most respondents (60 percent) reported investing in technology to study from home as the third coping mechanism. Strengthening their connections and support among relatives and friends ranks fourth. Spending family savings was the fifth option to cope with the financial pressures due to reduced income. The sixth and seventh options were investing in technology to work from home and do business online. The data showed that 68 households invested in technology to work from home. Because of this investment, 38 respondents had parents who continued working online.

Twenty-seven respondents said their families invested in technology, hoping to continue their business remotely. Of this group, 48 percent continued their business online, while another 48 percent reported temporarily stopping their business during the lockdown. This result implies that technology drives businesses to thrive despite the pandemic. This option, however, significantly increased spending on the Internet and electricity, as shown in Figures 11.2 and 11.3.

Borrowing money from the bank ranks as the 8th coping mechanism. Adesina-Uthman and Obaka's study (2020) similarly indicates that borrowing from banks was the least adopted coping strategy by households in Nigeria. The trend of responses showed that asking their children to stop attending school, borrowing money from employers, and using microcredit were among the least preferred options for families to cope with the adverse effects of the pandemic.

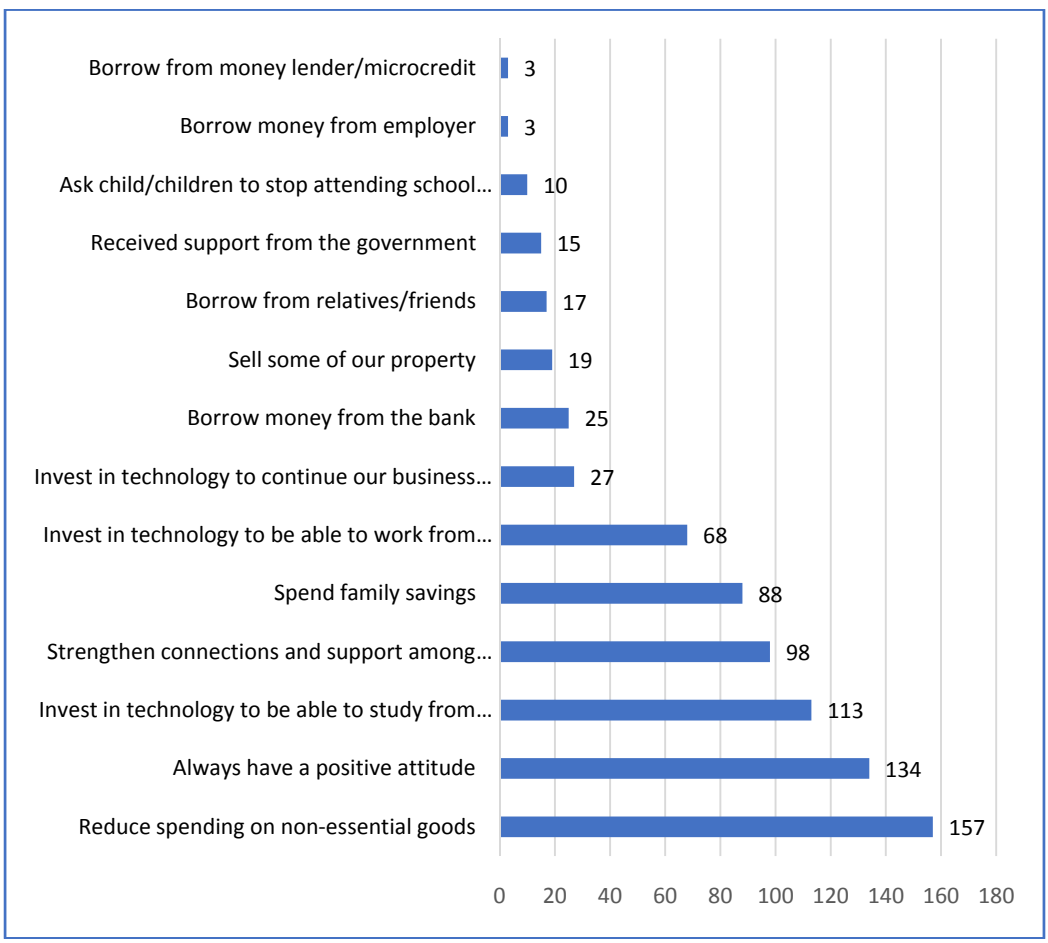

Figure 11.4: Coping Mechanisms of Families during the Pandemic

Sending children back to school was a common coping mechanism for parents. The findings reveal that not sending their children back to school was not a common coping mechanism for parents of CamEd students. This implies that parents put a high value on their children's education, which is an advantage to the school. One respondent said, "My family reduced spending on non-essential goods, but education is very important, so it comes first as we cannot stop attending school." This was confirmed by the data collected from the CamEd school, which revealed that only 1.6 percent to 3.9 percent of first-year students did not return to school. These figures are much lower compared to the pre-pandemic time, where enrollment in the first semester of 2019 dropped by 7.4 percent in the second semester. Thus, the proportion of 2019 first-year students in the Bachelor's program advancing to the higher years during the pandemic period (School year 2020 and School year 2021) was appreciative. It was remarkable that despite the health and economic crisis, most students resumed their studies at CamEd Business School.

The trend of first-year students' enrollment showed that in the school year 2021, CamEd bounced back by getting more new entrants, with a 46 percent increase in enrollment during the first semester. These results imply that CamEd, as an educational institution, was resilient and was least impacted by COVID-19 in terms of enrolment and dropout rate.

Business resilience is "the ability of an organization to cope with different challenges. This includes maintaining a steady flow of business operations while safeguarding employees, business assets and general brand equity" (DisasterSolutions, 2018). Another factor that may have boosted the resilience of CamEd is students' confidence in the high employability of its graduates, as revealed in a study by Uy (2021) that six out of ten respondents viewed it as easy for them to find a job if they are a graduate of CamEd Business School. The ability of the school to quickly adopt a new teaching model was also one of its strengths. Another factor could be the fact that CamEd is a significant reservoir of workforce for audit firms that were least likely affected by the pandemic, as shown in the study by Ng (2020) that "revenues at some accounting firms are increasing despite the pandemic" through increasing consulting services they provide to their clients. Other contributing factors may be investigated in a separate study in the future to learn more about best practices and the dynamics of ensuring long-term business resilience.

5. CONCLUSION

Most respondents came from families with four to six members and two to three children attending school. A majority of them have both fathers and mothers as breadwinners. Almost half of them derive income from the family business, while almost the same proportion relies on parents' employment in the public or private

sectors. During the pandemic, two of ten households had children who stopped attending school. It was found that families with more income earners were least likely to have children who stopped studying. Eight of every ten families had experienced a reduction in family income. Almost half of the respondents reported that their businesses were temporarily closed, while a few closed them permanently. Family savings also dropped, but a few reported an increase in savings because they sold a property and took credit from the bank. Spending on food, electricity and water increased. Expenses for the Internet significantly increased, but expenditures for travel and durable goods fell considerably.

The respondents reported having experienced stress, lack of focus on their studies, fear that anyone in their family will get sick from COVID-19, and hopelessness. Many were worried that they could not continue their studies, transfer to another school with less tuition fees, or stop schooling and find a job to help their family. Seven respondents reported having a family member who got infected by the virus but had recovered, and six respondents reported losing a family member to this deadly disease.

The most common coping mechanisms of the families were reducing family spending on non-essential goods, having a positive attitude, investing in technology to be able to study from home, strengthening connections and support among relatives and friends, spending family savings, and investing in technology to be able to work from home and to continue business remotely. Asking children to stop attending school was among the least preferred options for families. As proven by school data on enrolment and the proportion of students continuing to higher years, CamEd Business School appeared to be more resilient. The COVID-19 pandemic has had a negligible impact on enrolment and dropout rates. CamEd's business practices and processes look proactive and easily adjust to the changes brought about by the sudden economic downturn caused by the prolonged COVID-19 pandemic.

However, this study has its limitations. The 188 respondents may not represent the 2,159 students pursuing a bachelor's degree at CamEd Business School, and the result cannot be generalized to the whole school's population.

6. RECOMMENDATIONS

Based on the results of this study, the following recommendations were drawn: Should the school decide to start in-person classes, it must coordinate and collaborate well with the Ministry of Health to be updated on the local transmission trends and undertake timely measures for the safety of the school community. Students must be mapped to know their zones of origin. Class size must be reduced to ensure social distancing inside the classrooms.

With the rising spread of a more transmissible Delta variant, most cases were detected in Phnom Penh (Khmer Times, September 6, 2021). The faculty and staff, particularly those at higher risk, like those 60 years and older, people with health conditions, or pregnant women, may be considered to work from home to prevent exposure to the disease.

For the school facilities, frequent disinfection shall be carried out regularly. The school may improve indoor air quality by installing air purifiers in all enclosed classrooms as, based on a CDC study, "schools that used HEPA filters in their classrooms had a 41 percent lower COVID-19 rate compared to those that did not" (Vanzo, 2021). The Ministry of Health posters on health protocols, such as the "three do's and three don'ts" and "two submissions," must be posted in conspicuous areas in the school.

The school may provide the students with an in-person or online/telephone counseling program, encourage them to connect with their friends and create small peer support groups. The teachers and school staff may be more sensitive to the student's concerns to identify those experiencing stress and may refer them to the school counseling office when needed. The school shall also make compulsory the policy for students to stay home if they are not feeling well. It also encourages students to get complete vaccinations and to cascade the health message to their respective family members to mitigate the impact of the disease. Monitoring of school dropouts during the pandemic may be done, and the school may re-invite and encourage those students to return to school, making them feel that "CamEd cares" for their education and future.

CamEd must continue to build its image as an educational institution with high employability of graduates and continuously serve as a reservoir of the quality workforce for accounting and audit firms locally and globally to attract and retain more students.

Future studies could be undertaken with a bigger sample size to highlight the best practices and strategies that enhance the resilience of higher education institutions during health and economic crises.

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CHAPTER 12

The Integrity of Online Exams in the Online Learning Environment during COVID-19 at Higher Education Institutions in Cambodia

Bunthorn Yem

1. INTRODUCTION

"**Nothing is constant but change**," Greek philosopher Heraclitus said. Since change is a natural phenomenon, if being a change leader is hard, the best way to respond is to adapt. Resisting change can be a manner that would lead one to be left behind and suffer from it. A real example of a phenomenal change that is the most current is the mode of education imposed by the COVID-19 global pandemic. If any educational institution is resisting the current change or is unable to adapt, it would mean that they have no choice but to halt the momentum of the education process willingly. Only an institution that can adapt to it can ensure the continuous education process. To gather experiences that will help institutions grow, they should learn not to get stuck in the past and let the current of existence take them to new, unknown places (Archon, n.d.). That should be echoed by Bruce Lee's philosophy, which suggested that one should be like water and let it keep flowing, saying that 'running water never grows stale.' By the law of nature, however, change is natural. It is a part of life, and accepting it can lead to better growth and new possibilities. Without change, there is no opportunity. Only with change is there an opportunity for better growth. Only with change and by being capable of adapting to change is there an opportunity to learn new things and experience new possibilities.

There has been a paradigm shift in the world of education brought about by the Internet, which has taken away learning beyond the walls of universities and passed into the hands of everybody (Sarkar, 2020). Even though e-learning or online learning has become a worldwide demand or requirement during the COVID-19 pandemic, it does not mean that it is a new mode of study that has just been found. It is just that the concept has been updated. However, it was not widely practiced by schools and universities around the world before the pandemic due to the fact that they had the option to remain face-to-face. The majority of them enjoyed the comfort of the in-person mode. However, the contribution of technology towards change in education has been constantly improving. A dramatic improvement in technology in education

has been particularly noticed during the early 2020s. An abrupt shift to worldwide implementation of online distance learning when the COVID-19 pandemic started is a fact.

Distance education can be traced back to the 18th century, which became common in the 1800s and rapidly grew in the 1990s because of the advancement in the online technical revolution (Kentnor, 2015). A brief history of technology-mediated learning was traced back by Sarkar (2020) this way: Slide projectors and television-based classes began in the 1950s, an instance of online learning started in 1960 at the University of Illinois, the first completely online course was offered in 1984 by the University of Toronto, and the first online distance learning began in the early 1990s delivered by the Open University in Britain. According to the same author, Indira Gandhi National Open University in India is currently the largest university in the world, with around 4 million students enrolled, a majority among whom receive education online. A study on online education, conducted years back before the boom of online education imposed upon schools and universities around the world by the COVID-19 pandemic, found that online education was no longer a trend but a real mainstream, saying that out of 20.6 million students enrolled in higher education, 6.7 million were already enrolled in an online course (Allen & Seaman, 2013; United States Department of Education, 2013; as also cited in Kentnor, 2015). Also, Allen and Seaman (2003) found that 11 percent of all United States higher education students took at least one online course during the fall of 2002; 97 percent among public institutions, or 81 percent of higher education institutions (HEIs) in the United States, offered at least one online or blended course while 49 percent already offered an online degree program.

In the online learning process, because the faculty members have been facing many challenges regarding the teaching delivery methods, there can be many online applications for education for them to learn, adapt, and apply to their online classes. In contrast, learners at higher education levels have been well-accustomed to the online environment since the pandemic started; online student assessments such as short tests and exams have been the most critical parts of the issues that have been challenging educators and higher education institutions. Relevant stakeholders may have doubts and curiosity about the delivery methods of the online assessments and the monitoring procedure. In particular, external and internal quality monitoring or assurance units would likely question it. The question about the integrity of online assessments can even be considered more critical during the COVID-19 online learning context in higher education than in the older times.

Following COVID-19 was declared a global pandemic by the World Health Organization (WHO) in early 2020, the learning process in many schools and universities around the world either got stuck by the closure of the institutions or persisted in an online distance mode, and so did the assessment of learning processes.

Ireland's Queen's University Belfast, Queen's University of Canada, and Australia's Monash University canceled in-person exams due to COVID-19 (Meredith, 2020; James, 2020; Pringle, 2021). "Amidst universities canceling in-person exams, including University of Victoria and Queen's University, Western University isn't," according to Chaarani (2021). The author mentioned that some students at Western University were divided about the safety of being physically present for their exams. He interviewed a second-year accounting student who would write an exam and said he was not reluctant about writing his exams in person.

James (2020) praised online exams as a great way of maintaining momentum in higher education learning during a period not conducive to physical presence. Ahmed *et al*. (2021) acknowledged using technology for assessment purposes. They said that the execution of online exams is easier because the test takers are used to technologies through their daily usage of smartphones and other computerized systems. However, (Online Education, n.d.) claims that cheating is one frequently discussed topic in online education. King *et al*. (2009) said that the students held the perception that cheating in an online course was easier than that in the traditional one. At the same time, Watson and Sottile (2010) argued that, with the assistance of the Internet and related technologies, students could have many more ways to be academically dishonest than those of the previous generation. Ahmed *et al*. (2021) also questioned its interoperability, which may challenge the reliability of the student's answers. They said adequate facilities, testing security, and a backup plan need to be in place.

2. STUDY OBJECTIVE

The objective of the study is to address the question of the integrity of online assessments during the online learning environment imposed upon schools and universities by the COVID-19 pandemic. The focus is on online exams, such as the midterm and final exams, which happen specifically during the critical and challenging period of COVID-19. In the process, the study also intends to highlight the mode of delivery, invigilation system, and procedure of the online assessments.

The study intends to address the integrity of online assessments, namely online tests and exams. Therefore, it seeks to answer the following questions:

1. Why is academic dishonesty during online exams likely?
2. Why is ensuring the integrity of online exams a challenge?
3. How can the extent of integrity of online exams be assured?

3. LITERATURE REVIEW

Issues around academic integrity have appeared in many academic research publications. A significant number of related literature has discussed concerns related to academic integrity. However, suggestions from the previous studies focused mainly

on the technical content of the test or exam itself. The invigilation mechanism for ensuring academic integrity, the most important process when the exam is administered online or on-site, was not sufficiently explained. On the other hand, the literature on academic integrity in Cambodia's higher education context was inadequate, particularly the most related stories during the critical online learning environment imposed upon schools and universities by the COVID-19 pandemic. More importantly, no literature in the previous studies in the context of higher education in Cambodia has discussed a mechanism for administering online exams. Specifically, an appropriate and applicable mechanism for invigilating such exams is Internet-mediated and computer-based, commonly practiced in technology and digital media-led classroom settings.

3.1 Academic Integrity

Academic integrity covers more than just the concern over the students' assessments. According to 'The Massachusetts Institute of Technology' (n.d.), academic integrity is fundamental to students' academic work at MIT, reflecting integrity and responsible behavior. The handbook for students on academic integrity emphasizes honesty as the foundation of good academic work. It categorizes plagiarism, unauthorized collaboration, cheating, and facilitating academic dishonesty as aspects of it. Lee (2021) also states that plagiarism is one of the aspects of academic integrity. Lee classifies honesty, trust, fairness, respect, responsibility, and courage as the five pillars of academic integrity. In addition, Fishman (2014), cited in (Holden *et al.*, 2021), explains that academic integrity necessitates the commitment to the values of honesty, trust, fairness, respect, responsibility, and courage. One of the five fundamental principles for professional accountants in the 'Codes of Ethics and Conducts' is integrity, which means being straightforward and honest in all professional and business relationships (ACCA, n.d.; CamEd Business School, 2022). The Ohio State University highlights its expectation of the students with respect to academic integrity in that all the students will complete all academic and scholarly assignments with honesty and fairness (The Ohio State University, 2022). Harvard College (2022) declares in the 'Student Handbook 2021–2022' that members of the Harvard College community commit themselves to producing academic work of integrity and also warns that cheating on exams or problem sets, plagiarizing or misrepresenting the ideas or languages of someone else as one's own, falsifying data or any other instance of academic dishonesty is a violation of the community's standards and the standards of the broader world of learning and affairs. CamEd Business School (2022) also gives a warning statement in its 'Student Rulebook' preventing students from falsifying the result of one's research, stealing the words or ideas of another, cheating on an assignment, or not allowing or assisting another to commit all those acts, saying it corrupts the educational process (p. 15).

3.2 Academic Dishonesty or Cheating

Cheating, academic dishonesty, or misconduct are issues that have been happening and talked about in the academic world for a long time. Academic dishonesty, such as plagiarism, copying other students' work, or cheating in examinations, is a worldwide problem (Bacon *et al.*, 2019). Maeda (2019) said much research has been done on academic dishonesty, such as by Bowers (1964), Evans & Craig (1990), and McCabe & Trevino (1993), over the last century, especially in America. After the 2000s, the focus shifted to other parts of the world (Grimes & Rezek, 2005; Bernardi *et al.*, 2008; McCabe *et al.*, 2012; Buckner & Hodges, 2016); also cited in (Maeda, 2019). However, it is crucial to note that developing countries are still paying less attention to this issue, which urgently needs to be addressed.

Since the term 'academic integrity,' as discussed earlier, is all about the rule of 'honesty, trust, fairness, respect, responsibility, and courage,' the word 'academic dishonesty' or 'cheating' should simply, by contrast, be an act of breaking that rule. Academic dishonesty, according to Holden *et al.* (2021), is behavior such as the use of unauthorized materials, facilitation (helping others to engage in cheating), falsification (misinterpretation of self), and providing an unearned advantage over other students. Furthermore, the authors continue to elaborate on using the word 'E-dishonesty' to refer to behaviors that depart from academic integrity in the online environment, which raises new considerations that have never been previously considered by instructors and administrators. Rogers (2006) uses another word, 'e-cheating or digital cheating,' to describe students who find a way to cheat using computer technology. E-cheating also describes dishonest behavior in an online course (Styron & Styron, 2010; Moten *et al.*, 2013).

Brief History of Cheating

Cheating found in scholarly work has been a challenge for educators worldwide. According to McCabe and Trevino (1997), also cited in Mustapha *et al.* (2021), the first scholarly study during the 1960s found that somewhere between 50 and 70 percent of university students nationally in the United States had at least cheated once. An estimated 60 – 95 percent of undergraduate students employ dishonest tactics at some point in their university-level academic journal (Burton *et al.*, 2011; Simkin & McLeod, 2010, as cited in Bacon *et al.*, 2019). Dey (2021) stated that as colleges moved online during the COVID-19 pandemic, many universities were reporting cheating increases by more than three times during the 2020–21 school year at Virginia Commonwealth University, more than double from 2019 to last fall at University of Georgia, and more than 50 percent the previous year at Ohio State University. With reference to Schab (1991) and Jensen *et al.* (2002), as also cited in Maeda (2019), exam cheating in America is more prevalent in high school than in

university. In a study on 'academic cheating in Cambodia,' Sopheary (2017) reveals that cheating has run deep in the education system and has become a culture that needs a change in the attitude, policies, planning, implementation, and cooperation among all stakeholders. In addition, Maeda (2019) asserts that Cambodian students become involved in unethical and corrupt practices at very young ages. That should not be a surprise to see or hear about cheating cases because even a country known to be the best country in the world, like America, also has the same problem. A survey of over 20,000 American high school students shows that 51 percent admitted to cheating on a test, 74 percent had copied another student's homework, and 32 percent had copied an Internet document for a classroom assignment (Sideridis *et al.*, 2016; Bacon *et al.*, 2019). A big surprise is also the UK, one of the best education countries in the world. According to a report in 'The Times' (2016), some 50,000 university students had admitted to academic dishonesty within the previous three years (also cited in Morgan, 2016; Bacon *et al.*, 2019). Academic misconduct in medical discipline is even another concern.

Cheating Factors

It may be common to find a cheating case in an exam process being reported, particularly cheating cases found during online exam processes. What motivates cheating, however, is something worth looking at. It is a different issue whether cheating happens because of inadequate procedures, insufficient prevention measures, lack of policy, no detection method or system, or lack of highly secure exam platforms, or it happens because it is situational due to any other opportunity or environment. Rogers (2006) mentioned that over half of the faculty use online assessments, and there is some concern about online cheating. However, most of them do not proactively implement measures to prevent it. Crittenden *et al.* (2009) assert that a cheating culture, whereby everybody cheats because everybody else does it, is not just a capitalistic phenomenon but that attitudinal differences are driven by gender, country, corruption, and socioeconomic environment. Another issue worth studying is whether cheating factors tend to be more individual, institutional, or dependent upon the delivery method. It is suggested that four-dimensional factors should be looked at: internal, organizational, institutional, and social (Bertram, 2008; also cited in Chesney, 2009; Maeda, 2019). King *et al.* (2009) sought to gauge the behaviors of business students when taking an exam online, and the result indicated that respondents felt quite liberal in their view of potentially cheating behaviors when the course instructor set no test-taking policy. According to Baldwin *et al.* (1996), the best predictor of whether someone was likely to cheat was whether they had cheated before or not. Similarly, Crittenden *et al.* (2009) claim that a significant predictor of cheating in an undergraduate program is a history of cheating in high school, and it also increases the likelihood of cheating in a graduate program. In an assessment of

the prevalence of cheating in 31 medical schools in the US, only about five percent reported cheating during the first two years of medical school, while more than 70 percent reported cheating in high school (Baldwin *et al.*, 1996). The finding by Bacon *et al.* (2019) shows that the likelihood of engagement in cheating is associated with personality traits reflecting impulsivity and Fight-Flight-Freeze behaviors. Dey (2021) mentioned a real case at Columbia University where an assistant professor at the university tried to keep the students from cheating by getting the students in the Cognitive Neuroscience class to sign an honor code for their 1-week open-book exam, yet disappointedly found that they were still cheating. As for the case of Cambodia, Maeda (2019) found that the pass rate of grade 9 and grade 12 exams dramatically declined when strict anti-cheating measures were applied, compared to the pass rate in the previous years when such measures were not in place. Maeda (2019) said the influencing factors were curricula, parents' attitudes, peer behavior, institutional policies, and relationships with teachers. Sopheary (2017) found that cheating happening in the early 1980s was positively viewed from a human aspect, claiming that it was an attempt to save children from the risk of becoming a soldier if they did not pass the exam. However, according to Sopheary, corruption during the exam process was also one of the main factors for cheating among Cambodian students. Whitley (1998) reviewed factors associated with cheating among college students and found the strongest correlates to be such as having moderate expectations of success, having cheated in the past, studying under poor conditions, holding positive attitudes towards cheating, perceiving that social norm supports cheating, and anticipating a large reward for success. However, students are more likely to cheat if they believe that cheating is a social norm that everybody does (Genereux & McLeod, 1995) and if they believe that there is little chance of detection (also cited in Bacon *et al.*, 2019). Cheaters are differentiated from non-cheaters based on their perceived social norms regarding cheating, knowledge of the institutional policy, and attitudes toward cheating (Jordan, 2001). Jordan notes that students likely to cheat are motivated by extrinsic or performance factors such as academic standing, grades, or other performance evaluations.

Cheating on Online Exams

The students may find it much easier to cheat if the exam is conducted online than if it is delivered face-to-face in the exam room. In a traditional, face-to-face exam, a cheating student would be found having pocket notes, writing answers on the exam tables, rulers, or on pen and pencil cases, or even on their hands/arms or clothes (Curran *et al.*, 2011, also cited in Noorbehbahani *et al.*, 2021), or even hiding an answer sheet under their shoes, shirt, pants/skirts or hair (common for girl students); however, there is a significant change in cheating behaviors in online exams, although a few traditional actions may still be found. Some listed ways of cheating, which are

described to be unique to the online course environment, are downloading papers from the Internet and claiming them as one's work, using materials without permission during an online exam, communicating with other students through the Internet to obtain answers, or having another person complete an online exam or assignment rather than the student who submit the work, or using a remote desktop or computer with a share screen function (Jung & Yeom, 2009; Moten *et al.*, 2013; Rogers, 2006; Underwood & Szabo, 2003, as also cited in Holden *et al.*, 2021; Noorbehbahani *et al.*, 2021). The advancement of technology has eased ways of cheating on tests or exams in an online environment. There is an increasing number of ways that students can cheat through the support of the Internet, for example, with access to copyable articles, purchasing of coursework essays (so-called essay mills), and the facility to text examination questions and answers in real-time (Etter *et al.*, 2006; Simkin & McLeod, 2010; Thibodeau, 2007; also cited in Bacon *et al.*, 2019). Moreover, a more stunning way to cheat online has been made possible by an expert in the area. According to Thibodeau (2007), one may be able to earn an IT certification at home with the least effort; they only need to get a service from what the author calls the 'IT certification exam piracy market' available on a China-based website, which guarantees to take the test for their clients. Half of the high-tech vendors reported to the Association of Test Publishers in Washington in a survey that their exams were made available on the Internet, and 75 percent of them had encountered cheating on exams (Thibodeau, 2007). A recent study at Imperial College London found that the number of questions and answers posted on 'Chegg's homework help section' for five STEM subjects, only between April and August 2020, increased by 196 percent (Subin, 2021). Gill (2021) reveals 10 ways the students can cheat on the online exam by doing a screen share, using tech equipment such as Bluetooth mouse and keyboard, using auto-coding software for programming tests, pasting questions into a URL to find answers, asking a high achieving student to take the test, using a hard drive, USB or a smart device to copy the exam and sell it to other students after the exam, having a friend or a family member hiding behind the screen or webcam to help, simply doing a copy and paste, and giving excuses of poor Internet or power shortage to exit the exam or shut down the camera in order to look up answers. Challenging poor Internet during the exam might be an excuse for some cases. However, around 25 percent of the students reported not preferring online mode due to the Internet connection problem (Yem, 2021). Nonetheless, Subin (2021) asserts that working around the system is still possible even with proctored tests. According to Subin (2021), some ways the students do this include placing a phone on the desk after the room check, writing answers on their arms, using a calculator that plugs in answers, using a second monitor to switch between the screen and answers (also noted by Binstein, 2015), taping notes to the edge of the computer and desks or filling their keyboards with notes, and using a group chat to spread information.

Prevention of Cheating

When cheating is possible during student assessments, such as exams, the implication is that the system that ensures the integrity of the assessment is not adequate, or perhaps the method is not appropriate enough. There is a weak point in it, whether technically or unintentionally. It is worth considering the saying, 'Prevention is better than cure,' when preparing for the student examination and developing the measures to be taken against academic wrongdoing. The consequence will be well managed if the cause is well prevented. If the chance or opportunity for misconduct is made unavailable to the greatest extent, wrongdoing will also be unlikely. The performance of the students who take the exams will be proven, too. ProtorExam (2021) suggests six ways or strategies that cheating may be avoided. The first three of the tips are also suggested by Budhai (2020). First, the questions should be created to require higher-order thinking levels. Second, open-ended questions should be used to extract outstanding responses to their understanding of the course materials. However, objective or multiple-choice questions (MCQ) are argued by Dendir and Maxwell (2020) to be more amenable to cheating. Third, create a psychological impact by exposing the students to the academic integrity policies such as the online exam guidelines and the consequence of cheating if it is found. Fourth, multiple versions of the same test or exam should be created to ensure that it is not likely that all the students will have the same questions. Fifth, the true identity of the exam or test takers should be verified to ensure that the admitted person is the person who is supposed to attend the exam. Dignify (n.d.) also signifies the importance of authenticating the students during the exam, admitting that it is not as easy as an in-person exam to ensure the right person is sitting for the online exam. Lastly, a 360-degree scan in the exam space or room of the candidate or the test/exam taker should be ensured. One of the 14 tips given by Budhai (2020) is to delay the availability of the immediate score to prevent the student who finishes early from being able to advise the others who are still doing so. Lessening the exam score percentage that contributes to the overall course grade is also one of the strategies to mitigate online exam cheating (Noorbehbahani *et al.*, 2021).

Prevention can be almost impossible, however, if the primary variable is liable to too many other variables that need to be involved, which are, in reality, beyond one's control. Being beyond the control may mean it is not financially affordable, not technically manageable or doable, not technologically available, or not even time efficient. To be able to deliver online exams to the students, the school's capacity must not be questioned. As Yem (2021) mentioned, to support the online learning environment well, educational institutions must invest in technology infrastructure (p. 148). In that instance, even if the administrators are ready, it will be beyond the administrator's control if the institution is not. Also, the online exam solely depends

upon the Internet's stability. If the Internet is not stable, that is obviously beyond the control of the administrator or the student. Yem (2021) also said that the negative side of online learning has been known for the unstable Internet/WiFi (p. 147). One of the requirements for the online exam proctor at Harvard Summer School is that he/she must have reliable access to the Internet. The students' cheating behavior can be under control provided the institution is ready and the administrators are well-equipped. Thai Son from HCM City Food Industry University Teaching said, "Teaching online is hard work, and organizing the exams online is even harder" (Huyen, 2022). Huyen (2022) said that students always have ways to cheat on online exams, while schools always find new methods to discover them.

Honor Codes and Exam Rules and Regulations

All educational institutions, in general, when it comes to delivering, controlling, and/or invigilating the exams, apply their exam rules and regulations to the students. That may also include emphasizing the student code of honor or ethics, usually found in the school or university's rule or honor code book. However, honor codes may not prevent cheating even though they are indispensable (Baldwin *et al.*, 1996). However, a strict mechanism to ensure the implementation of exam rules and regulations may make cheating opportunities hard. Punishing students engaging in academic misconduct can be a highly effective way to ensure academic integrity. In usual practice, the exam rules and regulations are made available, disseminated, and/or read to the students before the start of the assessment in a certain way according to the protocol applied by the administrators at the institution. The message of the rules usually warns about any behavior that is not permitted and entails the consequences if that behavior is detected. This is a prevention method for quality purposes to ensure academic integrity during tests, exams, or other assessments.

The ACCA (Association of Chartered Certified Accountants) exam guidelines require the students to comply with every aspect of the guidelines (ACCA, n.d.). The guidelines list items permitted at the student's desk, 'what else' the students need to comply with, and instructions for the student's attention after the examination. Its exam regulations list twenty-two points for the students to be aware of and comply with and warn them that they will be liable to disciplinary action if found to breach the rules or guidelines. One of the points in the 'exam regulations' in a case of remote exam, for example, states that the exam will be discontinued, or the student will be removed or excluded from the exam if the student is suspected of irregularity or improper conduct (point #8). Taking an online exam at Harvard Summer School requires the students to find a qualified proctor to administer the exam because the students cannot come to an on-campus classroom exam (Harvard University, 2022). The procedure for finding a proctor states that the proctor must be a teacher, professor,

librarian, or administrator in a nearby secondary school, college, university, or test center and cannot be a family member, friend, acquaintance, or co-worker. There is a procedure that also requires the proctor to be able to have or to do such as the proctor must have an institutional email, reliable access to the Internet, the ability to download and print PDF documents, and access to a fax machine or scanner in order to return completed exam materials to the Summer School. The warning in the policy as a prevention method, according to Harvard, is that the students will be subject to referral to the Administrative Board for review if they submit false or inaccurate information to the proctor. Guidance and rules for online examinations and assessments at Birmingham University provide instructions to the students in three stages: the preparation stage, the examination stage, and further information. It lists rules and regulations in about fifteen bullet points. In one of the bullet points about sanctions, the rule states that sanctions that can be given for plagiarism or other forms of academic misconduct include reducing the mark to zero without an opportunity to re-sit, reducing the degree classification, and withdrawing from the university (University of Birmingham, 2022).

Professing such unethical behavior in the university environment has caused concern, as it might be replicated in the workplace in their later profession after university, thereby applying risk detection and severe penalties can be very effective (Haswell *et al.*, 1999). The rules and regulations may not be respected without considerable penalties for cheating students. "The exam invigilators did not see any reason to report a student cheating as there were no real consequences for the students," claims Cerimagic and Hasan (2019). The Invigilator Statement of CamEd Business School warns the students that all forms of cheating, including attempting and appearing to cheat, will automatically fail the course in question (CamEd Business School, n.d.). The 'Guidelines for Online Exams' of CamEd Business School require the students to strictly follow all the guidelines, procedures, rules, and regulations. The procedures for online exams require the students to open two live cameras during the exams. One of the cameras is live on Google Meet from the laptop for the invigilator to control the student's facial expression and eye contact during the exam, while the other camera is live on Google Meet from either a webcam or a phone for the invigilator to monitor the surroundings from where the students are taking the exams online. The invigilator and the students maintain live communication with each other via the video conferencing platform using the mic function or chat function on Google Meet throughout the exam session.

3.3 Assessment of Learning

Heywood (2000) briefly defines *assessment* as a multidimensional process for judging individuals and instructions in action (p. 13). Student assessment is the process of

evaluating the student's abilities and achievements (Scarsdale Public Schools, 2022); it is gathering and assessing the gaps between knowledge rendered and knowledge retained (ProPros, 2022). Doyle (n.d.) defines *student assessment* as the ongoing process of establishing clear, measurable expected outcomes of student learning, ensuring that the students have sufficient opportunities to achieve those outcomes, and systematically gathering, analyzing, and interpreting evidence to determine how well student learning matches the outcomes or expectations, and using the resulting information to understand and improve student learning.

In standard practices, more or less, but more often than not, undergraduate learners are expected to undergo some kind of assessment, be it a formative or summative assessment, or both. A formative assessment is regularly conducted to assess the ongoing learning progress to fundamentally adjust effective teaching methods to address the learning gaps or needs. On the other hand, a summative assessment is likely conducted at the end of the course or program to conclude the achievement of the learning performance in the framework of the expected learning outcomes of the course or program. Types and loads of assessments may vary by subjects, courses, or study programs. Some courses may list exams as one of the essential assessment criteria, while others may require no exams at all. Some may have many tests and exams, while others may have fewer. Science subjects may popularly be known for strict and complex examinations, while humanities and social science subjects or courses may not.

Assessments in 'English Language and Literature,' an undergraduate program at the University of Oxford, include examinations and portfolios of essays (University of Oxford, 2022). The university page writes that most Oxford courses are assessed by examinations at the end of the first and last years, clarifying that learners must pass all the exams to progress to the second year and pass the final exams or finals to pass the degree. Similarly, submitting a satisfactory senior essay and completing the oral examination are the conditions for receiving the degree of 'Bachelor of Arts in Liberal Arts' at St. John's College (St. John's College, 2022). The oral exam explores the ideas the student put in his/her senior essay. St. John's College page writes, "During an oral examination, a committee of tutors sits down with the student and challenges the implications and conclusions the student put forth in their essay. No degree is awarded unless the essay and the oral examination are satisfactory." CamEd Business School's bachelor program specification states that the students will earn the degree after passing 35 courses in the program (CamEd Business School, 2022). In addition, each course in the program, available on the school's website, lists similar assessment criteria: participation, attendance, tests or quizzes, assignments, midterm exams, and final exams. However, loads of work or assessments can vary by different courses in the program. According to the curriculum on the school's website, the 'MKTG 101' course, one of the courses in the foundation year program, lists only

three short tests, one assignment, a midterm exam, and a final exam, while the second-year course 'ECON 201' lists up to 20 short tests plus two assignments, midterm exam, and final exam. However, midterm and final exams are required in almost all of the 35 courses in the program, according to the 'assessment and grading' section listed in each of the courses in the curriculum available on the school website.

4. CONCEPTUAL APPROACH TO ENSURING EXAM INTEGRITY

In an attempt to strengthen the quality and to eliminate cheating, which had been so notorious in Cambodian upper secondary exams, the Ministry of Education, Youth and Sports (MoEYS), under the leadership of His Excellency Dr. Hang Chuon Naron, launched a grade-12 exam reform in 2014, which significantly affected the pass rate. A dramatic decline in the pass rate, from more than 80 percent over the previous 4 years to less than 50 percent in the 2014 upper secondary exams, was noted by Sopheary (2017). Taguiam and Moss (2015) also reported that the MoEYS enforced anti-cheating measures in the 2014 grade-12 exams, which resulted in a low pass rate. Even though the pass rate was severely affected, UNESCO Education Specialist Santtosh Khapri praised the reform as Cambodia's most significant leap forward (Taguiam & Moss, 2015).

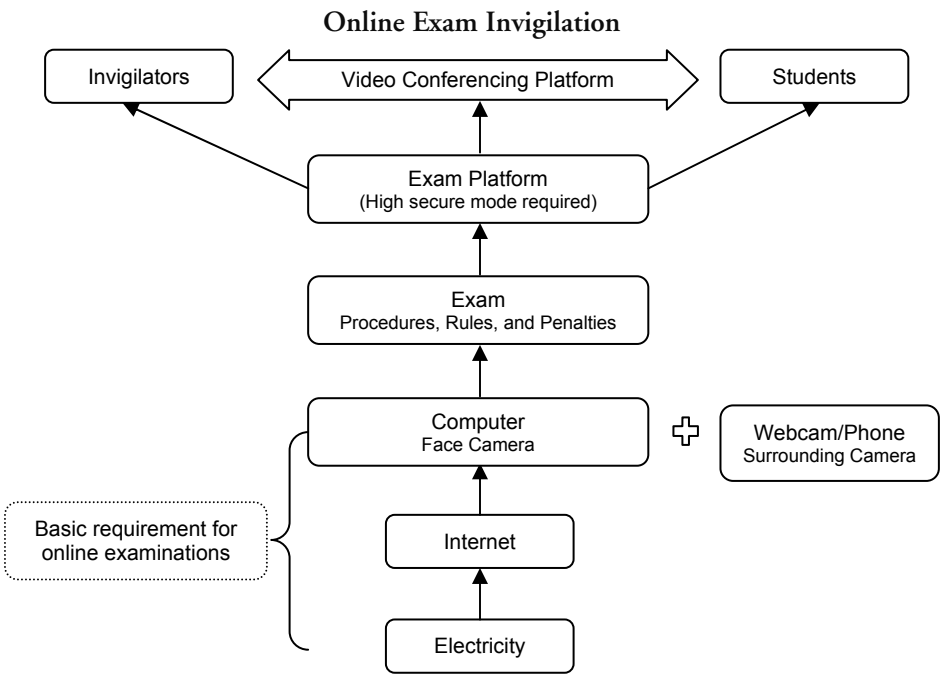

Figure 12.1: Conceptual Approach to Ensuring the Integrity of Online Exams
Source: Author

While strengthening the procedures and rules may be effective for preventing cheating in in-person paper-based exams, the strategy can be inadequate for the same purpose for online exams and/or in-person computer-based exams. Paper-based exams are still practiced in schools and universities in Cambodia during this technology-driven world of education. However, Internet-mediated, computer-based exams have become the trend since the shift of education mode when COVID-19 started. The new trend of such modes of exams emerged among fee-charging schools or universities. Thus, having a clear and strong procedure to ensure the integrity of exams in such a mode is crucial.

Figure 12.1 presents a self-elaborated conceptual approach to ensuring the integrity of online tests or exams. Technically, the mechanism can be applied to both on- and off-campus modes of computer-based and Internet-mediated exams. The first may differ from the latter in that one requires a live video conferencing platform and positioning of the cameras that may be required, whilst the other does not. Variables are interdependent, ensuring that the exam invigilation process meets the exam's objective to a certain extent.

5. STUDY METHODOLOGY

5.1 Research Site and Participants

Due to convenience and opportunities to reach the research participants in the technology-enriched environment of the institute, the study purposefully selected a private higher education institution located in the center of Phnom Penh, Cambodia, as a research site. The study's subjects were all the students in an undergraduate program majoring in accounting and finance.

The study also took into account the capacity of the higher learning institution to ensure digital facilities for teaching and learning processes, the English-speaking environment, the habit or culture of communication using digital devices such as smartphones and computers, and platforms and apps for communication such as email and other apps regularly used in the school environment.

The total number of accounting students, excluding duplicates, was 1,974, according to the calculation of all the first-year, second-year, third-year, and fourth-year students studying in the first semester of the academic year 2021.

5.2 Data Collection

The study accessed primary and secondary data. The primary data was collected through an online survey using the Google Form application. The questionnaire was created on the Google Forms platform and emailed to all the participants. Participation in the online survey was voluntary. All responses received were kept confidential. The

study did not provide any financial incentive for participation in the online survey. Classification of the genders of the research subjects was not considered necessary based on the research objective. All the questions were in English, and no translation into a different language of any question in the questionnaire was required as the accounting program that the study selected was an internationally accredited program in which English was the medium of instruction. Further, all the students had to pass an English admission test when entering the program. Also, students were used to online education tools such as Google Forms and others as they had been experiencing hands-on online learning mode since the COVID-19 pandemic.

The secondary data were reports available on the school portal and sources received from the institution's administration office. The secondary data discussed and analyzed were cheating reports, exam attendance report sheets, and invigilation mechanisms of online exams. Other sources, such as procedures and platforms related to the online exam invigilation process, were also considered. In addition, information verbally disclosed from the administrative office and the researcher's observation were also included in the result.

5.3 Data Analysis

The study applied quantitative and qualitative methods to analyze the primary data gathered from the participants. Although the survey questionnaire asked the participants eight questions in total, in one of the questions, 40 items were listed for the participants to respond. Mainly, the participants were asked to level their agreement or disagreement to statements listed on the questionnaire on a scale of 'strongly agree, agree, neither agree nor disagree/neutral, disagree and strongly disagree.' Out of the eight questions, however, three were open-ended questions asking the participants to provide a more critical idea or thought about the topic. Their thoughts were analyzed, summarized, and/or grouped into themes. A few original statements by the study participants related to the integrity of online exams were also quoted and presented. The data were analyzed and presented in tables and figures using spreadsheets as an analytic tool.

6. EMPIRICAL FINDINGS

The number of responses in the survey was limited to 171 students. The limited number of participants in the study could be interpreted in two ways. First, the online survey asked the participants to answer the questions voluntarily. Second, the topic of 'integrity of online exams'—cheating on exams—was perceived as sensitive to the students. Also, the total number of responses was eventually reached after we sent two follow-up reminders to the participants.

6.1 Demographic Responses

Most of the study participants were in the first year of the undergraduate program, accounting for up to 53.2 percent of all the respondents. Surprisingly, the students in the third year provided the fewest responses (9.4 percent). The second and fourth-year students accounted for more than one-third (37.4 percent) of the responses.

6.2 Excuses or Factors Leading to Cheating during Online Learning Classes

As a way to get around to the core topic, 'cheating on online exams,' the study asked the participants to first level their agreement or disagreement on a scale of 'strongly agree, agree, neutral, disagree, and strongly disagree' with the given factors that could lead to cheating on online classes. The given factors were not opening the computer camera during class, forgetting to scan or sign the online attendance, and never participating in any online class activity. As shown in Figure 12.2, more than one-third of respondents took a neutral view when answering the three questions. The reason behind this could be because, as verbally reported by the administrative staff of the school and also from the researcher's observation, it generally happened with all online

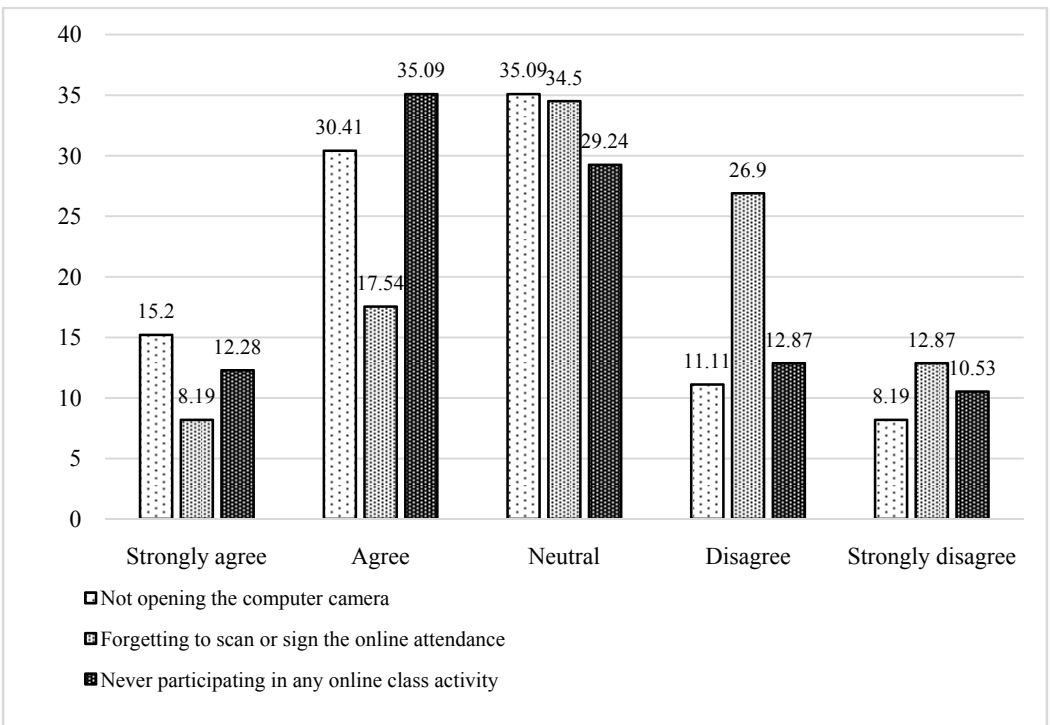

Figure 12.2: Presentation of Excuses or Factors of Cheating on Online Classes %

Source: Primary data computed by the author.

classes where the students rarely put their cameras on during class unless insisted by the class professor for a certain purpose for particular duration during the session. This includes class participation, quiz, or test. However, a higher percentage of respondents agreed on not opening the computer camera during class (45.61 percent against 19.3 percent disagreed) and never participated in any online class activity (47.37 percent against 23.4 percent disagreed). Obviously, the respondents did agree with the two statements that those were the factors that could lead to cheating. Nonetheless, 'forgetting to scan or sign the online class attendance,' received higher responses from the 'disagree' side than from the 'agree.' The respondents disagreed that it could be cheating.

6.3 Behaviors or Excuses or Pretenses or Factors Leading to Cheating during Online Exams

The participants were asked to respond through their agreement or disagreement to 40 sub-items or questions on a scale of 'strongly agree, agree, neutral, disagree, strongly disagree.' The 40 sub-items in Table 12.1 focused mainly on all behaviors, excuses, pretenses, or factors happening during online exams that could lead to cheating.

Table 12.1: Excuses or Factors of Cheating on Online Exams

#	*Excuse or Factor or Behavior*	*Levels of Agreement (%)*				
		Strongly Agree	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*
1.	Not opening any cameras	20.47	39.18	26.90	7.60	5.85
2.	Opening only the computer camera	10.53	35.67	36.26	9.94	7.60
3.	Opening only the side camera	7.02	22.22	41.52	18.13	11.11
4.	Disconnecting the computer camera	9.94	15.20	40.94	25.15	8.77
5.	Disconnecting the side camera	12.28	16.37	38.60	22.22	10.53
6.	Not showing face on the computer camera properly	11.70	40.35	30.41	11.70	5.85
7.	Not positioning the side camera properly	9.94	27.49	39.18	14.04	9.36
8.	Not following the 360-degree camera procedure properly	9.94	30.41	33.33	16.96	9.36
9.	Spending too much time setting up the cameras	9.94	14.04	38.60	22.81	14.62

#	*Excuse or Factor or Behavior*	*Levels of Agreement (%)*				
		Strongly Agree	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*
10.	Often disconnecting the Internet	8.77	16.37	35.09	23.98	15.79
11.	Having a slow Internet connection	8.19	11.11	24.56	27.49	28.65
12.	Having a power outage	7.02	11.11	25.15	25.73	30.99
13.	Wearing a headset or earphone	10.53	29.24	36.26	7.02	16.96
14.	Wearing a face mask	8.19	22.22	41.52	13.45	14.62
15.	Putting a hand over the mouth	8.77	18.71	42.11	17.54	12.87
16.	Answering a phone call	9.36	12.28	38.60	25.15	14.62
17.	Reading the exam questions out, whilst the exam rule does not allow to do so	12.87	18.13	35.09	15.20	18.71
18.	Going to the bathroom	7.02	11.70	40.94	23.39	16.96
19.	Using someone else's email account	19.30	34.50	26.32	10.5	9.36
20.	Using someone else's laptop	9.94	15.20	36.84	22.81	15.20
21.	Sharing own login access with someone else	18.13	32.75	26.3	11.70	11.11
22.	Logging in with more than two devices	17.54	19.88	32.16	16.96	13.45
23.	Doing it next to other students or family members (having friends or family members around, hiding behind the camera)	17.54	33.92	29.24	12.28	7.02
24.	Not hearing the invigilator speaking	7.60	18.71	38.60	21.64	13.45
25.	Ignoring the invigilator's instructions	14.62	39.18	32.75	5.85	7.60
26.	Seeing/knowing/hearing that some students cheat	9.36	26.90	42.69	12.87	8.19

#	*Excuse or Factor or Behavior*	*Levels of Agreement (%)*				
		Strongly Agree	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*
27.	Socializing with cheating students	11.70	26.90	34.50	15.20	11.70
28.	Struggling to pass the subject	12.87	19.30	39.18	16.96	12.87
29.	Ignoring the exam rules	11.70	35.09	36.26	8.19	8.77
30.	Pretending to forget about the exam rules	16.37	33.92	25.73	12.87	11.11
31.	Doing it in a room without enough light	7.02	14.62	39.18	22.81	16.37
32.	Doing it in a room with too much light	5.26	11.70	43.86	22.81	16.37
33.	Having too much brightness on the laptop screen	5.85	17.54	40.35	19.88	16.37
34.	Not having enough brightness on the laptop screen	6.43	14.62	46.20	16.96	15.79
35.	Having a noisy background	6.43	15.79	33.92	22.22	21.64
36.	Always having technical problems	8.77	18.13	37.43	19.88	15.79
37.	Behaving suspiciously to the invigilator	12.87	35.67	33.33	9.94	8.19
38.	Not projecting the camera properly to the place when asked, as instructed by the invigilator	22.81	40.35	22.22	6.43	8.19
39.	Showing up very late for the online quiz/exam	7.0	20.47	46.20	14.04	12.28
40.	Leaving the online quiz/exam very early	5.85	12.28	42.69	18.13	21.05

Source: Primary data computed by the author.

Of all the 40 given factors, eight outstandingly received the most responses, between 50 to more than 60 percent, way higher than those on the 'disagree' side (Figure 12.3). The respondents either strongly agreed or agreed that those were cheating behaviors or factors during an online examination. Those eight given factors were not opening the camera (59.65 percent agreed against 13.45 percent disagreed),

not showing the face on the camera properly (52.05 percent agreed against 17.54 percent disagreed), using someone else's email account (53.8 percent agreed against 19.88 percent disagreed), sharing the login access with someone else (50.88 percent agreed against 22.81 percent disagreed), having other students or friends or family members around hiding behind the camera (51.46 percent agreed against 19.3 percent disagreed), ignoring the invigilator's instructions (53.8 percent agreed against 13.45 percent disagreed), pretending to forget about the exam rules (50.29 percent agreed against 23.98 percent disagreed), and not projecting the camera properly to the place, when asked, as instructed by the invigilator (63.16 percent agreed against 14.62 percent disagreed).

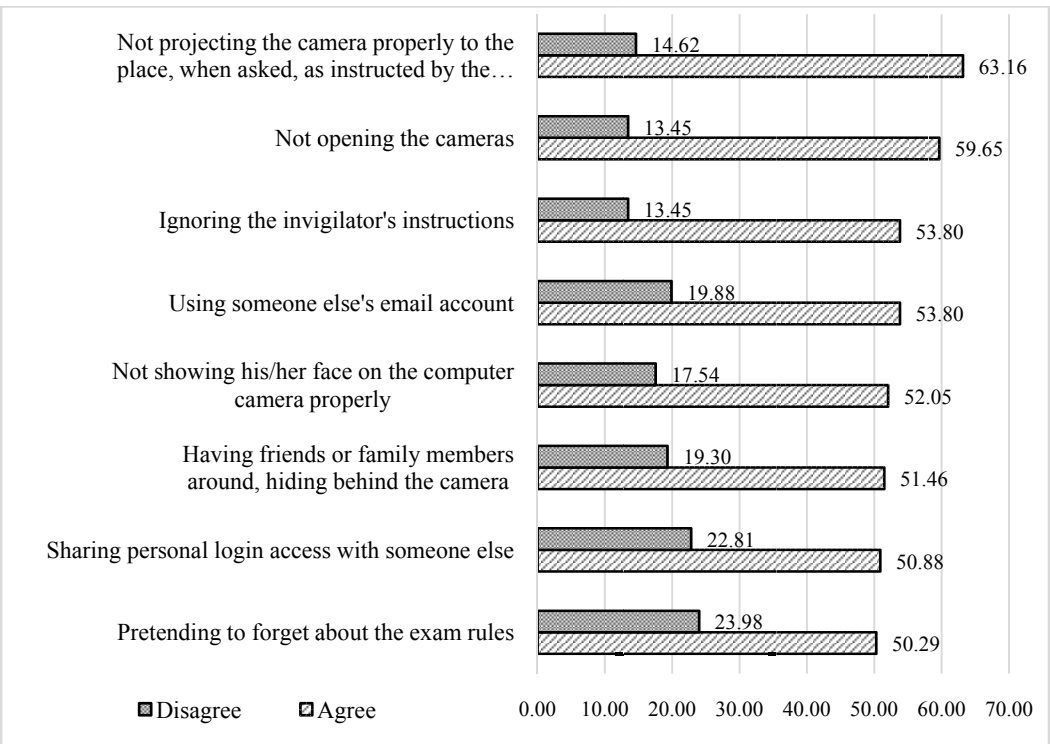

Figure 12.3: Presentation of Cheating Behaviors or Factors by Students % (Part 1)
Source: Primary data computed by the author.

On the 'disagree' side, however, six out of the 40 given factors noticeably received a high percentage of responses (40 - 57 percent) compared to those on the 'agree' side (Figure 12.4). The respondents either strongly disagreed or disagreed that those were cheating behaviors or factors during an online exam. Those six factors include going to the bathroom (40.35 percent disagreed against 18.71 percent agreed), having a noisy

background (43.86 percent disagreed against 22.22 percent agreed), often disconnecting the Internet (39.77 percent disagreed against 25.15 percent agreed), answering a phone call (39.77 percent disagreed against 21.64 percent agreed), having a slow Internet connection (56.14 percent disagreed against 19.3 percent agreed), and having a power outage (56.73 percent disagreed against 18.13 percent agreed).

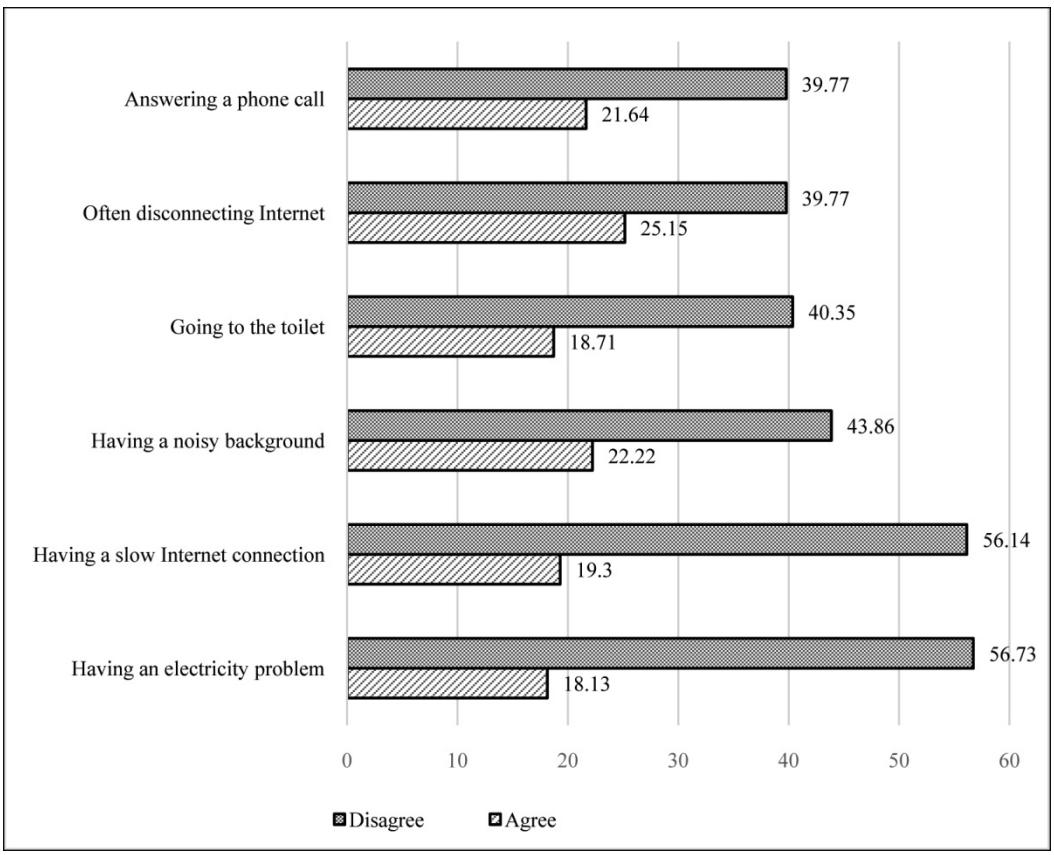

Figure 12.4: Presentation of Cheating Behaviors or Factors by Students % (Part 2)
Source: Primary data computed by the author.

In contrast to the disagreement, on the 'agreement' side, five other given factors received a high percentage of responses from the participants, 40 to 49 percent, approximately twice as high as those on the 'disagree' side (Figure 12.5). The respondents either strongly agreed or agreed that those were cheating behaviors or factors during an online exam. Those five factors include opening only the computer camera without the side camera (46.2 percent agreed against 17.54 percent disagreed), not following the 360-degree camera procedure properly (40.35 percent agreed against 26.32 percent disagreed), ignoring the exam rules (46.78 percent agreed

against 16.96 percent disagreed), behaving suspiciously to the invigilator (48.54 percent agreed against 18.13 percent disagreed), and wearing a headset or earphone (39.77 percent agreed against 23.98 percent disagreed).

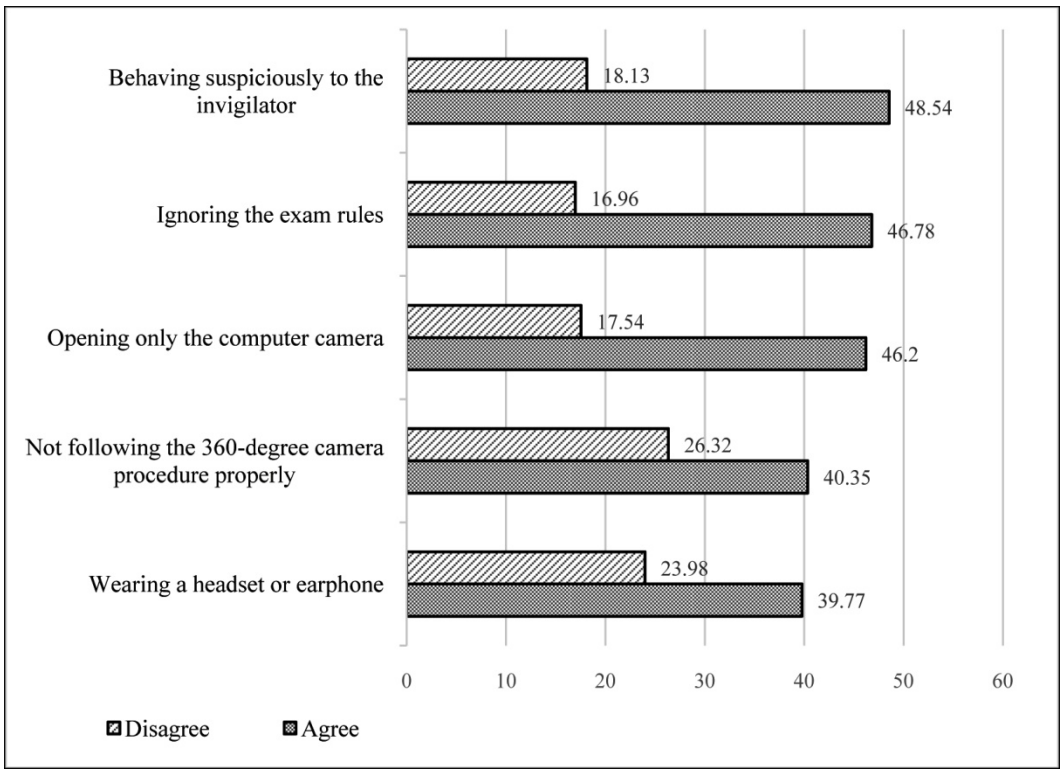

Figure 12.5: Presentation of Cheating Behaviors or Factors by Students % (Part 3)
Source: Primary data computed by the author.

Figure 12.6 shows that the remaining 21 given factors interestingly received almost a similar percentage of the responses from both 'agree' and 'disagree' sides, and their percentages were lower than 40 percent for all. More interestingly, one of the given factors, opening only one camera, that is, the side camera, during the online exam, received the same rate of responses: 29 percent agreed against 29 percent disagreed. Even though those remaining given factors received a similar rate of responses from both sides, the response rate from the neutral side was 40 percent of the total, whilst the 'agree' side received about 28 percent and the 'disagree' side 32 percent. So, it showed that, on average, 40 percent of the participants neither agreed nor disagreed with the 21 given factors, whether each was a cheating behavior or not.

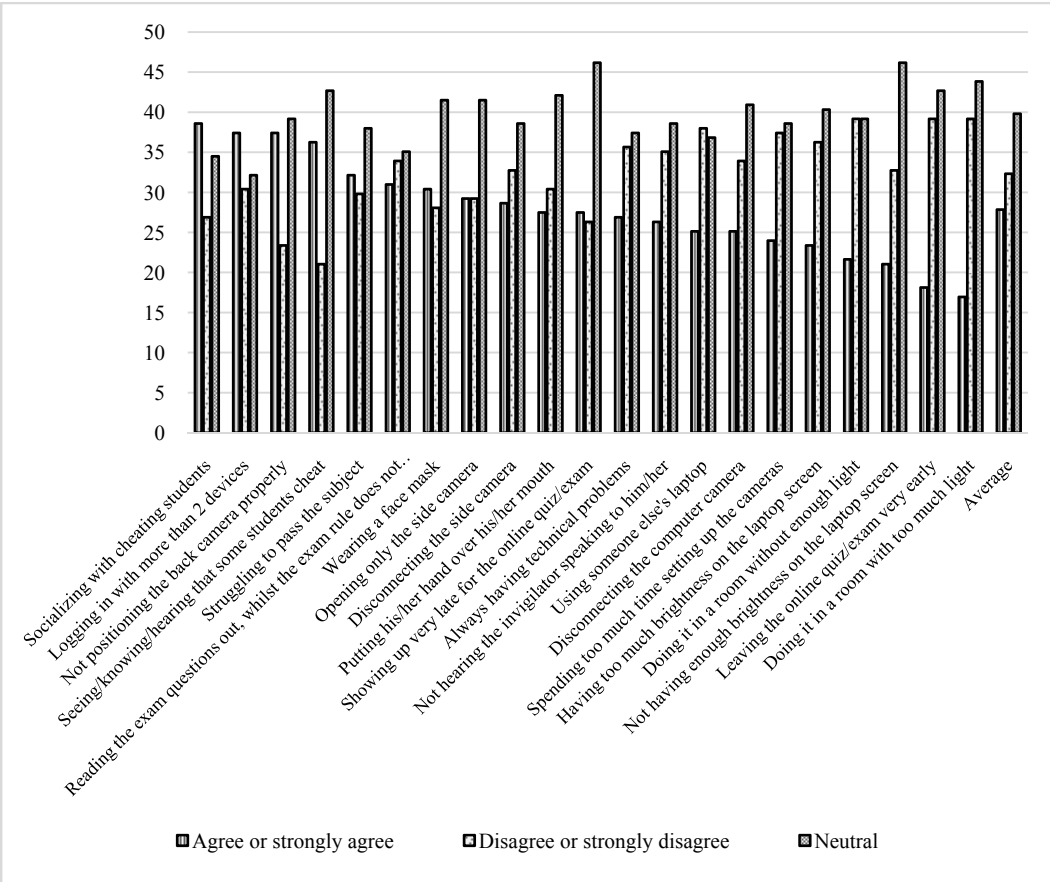

Figure 12.6: Presentation of Cheating Behaviors or Factors by Students % (Part 4)
Source: Primary data computed by the author.

Awareness of Cheating

The study asked three open-ended questions to gather critical ideas on academic dishonesty, specifically cheating on online exams.

The first question asked, 'How did the students cheat on an online exam without being noticed by the invigilator?' The survey reveals that more than 73 percent of the responses claimed they had no idea how the students could cheat without the invigilator noticing them. A respondent was surprised and asked, "Can students cheat?" A few others said they had no such experience. "Do they even dare to do that?" one participant asked. Some said they were too busy with their exams and never had time to notice anyone else. A few others said they had no idea and guessed that perhaps they had a phone call or may have used earphones to talk to others during the exam. A few said they had no idea and thought the students did it when

the camera was off or when they only had the face camera on. They opened a new tab and made it so small that the invigilator did not notice it. More than 26 percent of the participants said the students had their answers written on the table/desk or in their hands. They divided their computer screen into two, one side for the exam and the other for online chat. They had a third-party app to help them contact each other during the exam. They wore face masks, had group calls, and used earphones. They could search on the Internet. They checked the answer when they were in the bathroom. They copied the answer before the exam started and pasted it during the exam. They had someone access their computer through a means of team viewer. They pretended to be working on the exam and not to look suspicious. They used a piece of tape to cover the microphone of the back camera phone, even if it was unmuted, so as not to let the voice be heard when talking. They used an online app like Discord to communicate during the exam. They could have someone read out the answer to them during the exam. They put the answer behind their computer screen or on a wall and away from the visibility through the back camera, and the invigilator would think that they only looked at their computer screen. They could gather in groups in the same place to take the online exam. They could join with multiple devices. They put the document under the table/desk. They could have a second device placed far behind their computer to show themselves the answers during the exam.

The second open-ended question asked, 'Why did the students cheat?' The responses were summarized and grouped into themes shown in Table 12.2. According to the findings, 37.43 percent suggested that cheating occurred due to the desire for grades, either to get a pass or a good grade. Interestingly, around 18 percent said that cheating occurred due to the students' laziness during their study and exam review

Table 12.2: Additional Factors of Cheating by Students

Additional factors of cheating	*Responses (%)*
Grade (To pass or to get a good grade)	37.43
Being lazy	17.55
Not understanding the lesson	7.60
Being situational (Online)	4.68
The exam was hard	4.09
Result of the study load	1.75
Being nervous	1.75
No comment	25.1

Source: Primary data computed by the author.

processes. In comparison, 7.6 percent said cheating happened when the students did not understand the lesson. Only 4.68 percent said cheating occurred due to the online environment being situational for cheaters. Another 4.09 percent said it happened due to the exam being too hard. Only around 2.0 percent suggested that cheating was the result of study load and nervousness. Also, 25.15 percent did not provide any opinion on that.

The third open-ended question asked, 'How can cheating be prevented?' The answers from the participants were summarized and grouped into themes, as shown in Table 12.3. Although the result showed that around 41.0 percent of the respondents did not provide any suggestions or ideas, around 31.0 percent suggested the exam platform was already secured enough, and the school was already doing it right and should continue to be strict and fair in terms of executing the exam rules and punishments against cheating behaviors. Notably, one of the responses was, "Nothing more as the school is doing the right thing." Also, 13.45 percent suggested that students should pay more attention, study hard, do more reviews of the lessons, and practice more before the exam, implying that cheating was the result of not doing all of them. One of the responses was, "Not the majority of students are cheating, but only a few; the students must know their duty of being honest." Only 5.85 percent of respondents inferred that cheating resulted from online exam mode, so they encouraged it to be conducted in a physical mode at school. Around 4.0 percent of the responses suggested that the exam should be created in multiple versions or test open-ended questions rather than remembrance. Similarly, 3.51 percent of respondents recommended that ethics should be instilled and promoted more regularly among students.

Table 12.3: Cheating Prevention Measures Suggested by Students

Measures to Prevent Cheating	*Responses (%)*
Keep strict and fair, execute the rules and punishments, and have a secure platform.	30.99
The students should pay more attention, study hard, review more of the lessons, and practice more exam-type questions before the exam.	13.45
The school should provide more tutorial classes free of charge.	1.75
Promote ethical behavior and instill it in students more regularly.	3.51
The exam should test knowledge from the book, more open-ended questions, or have different versions.	3.51
The exam should be conducted in person rather than online.	5.85
No comment	40.94

Source: Primary data computed by the author.

Cheating Report

The study also collected secondary data from the institute's administration office regarding the number of cheating cases reported by the invigilators to the administration department. The data was not made public due to some sensitivity that the administration prevented. The cheating report shown in Figure 12.7 presents the number of cheating cases reported by the invigilators and does not show the student's name involved in cheating and the exam subject on which they cheated. It also shows the number of cheating cases reported in the midterm exams and final exams in different academic terms from the January-June 2021 term to the first half of July to December 2022 academic term, during which all the exams were conducted online, either everyone was doing the exam entirely online, or some were online, and some others had the option to take it at school physically. Whether the exams were online or conducted physically in the classroom, all exams were computer-based and Internet-meditated.

According to the data presented in Figure 12.7, cheating was very likely in online exams, mainly when the exam was conducted without using a secure platform to prevent cheating. A total of 20 cheating cases were reported in the January – June 2021 midterm exams, and the number kept increasing by 35 percent for the midterm exams and 100 percent for the final exams from January – June 2021 to July – December 2021, respectively. The number went down to 36 and 31 in the January – June 2022 exams when the institute conducted the exams in a hybrid mode.

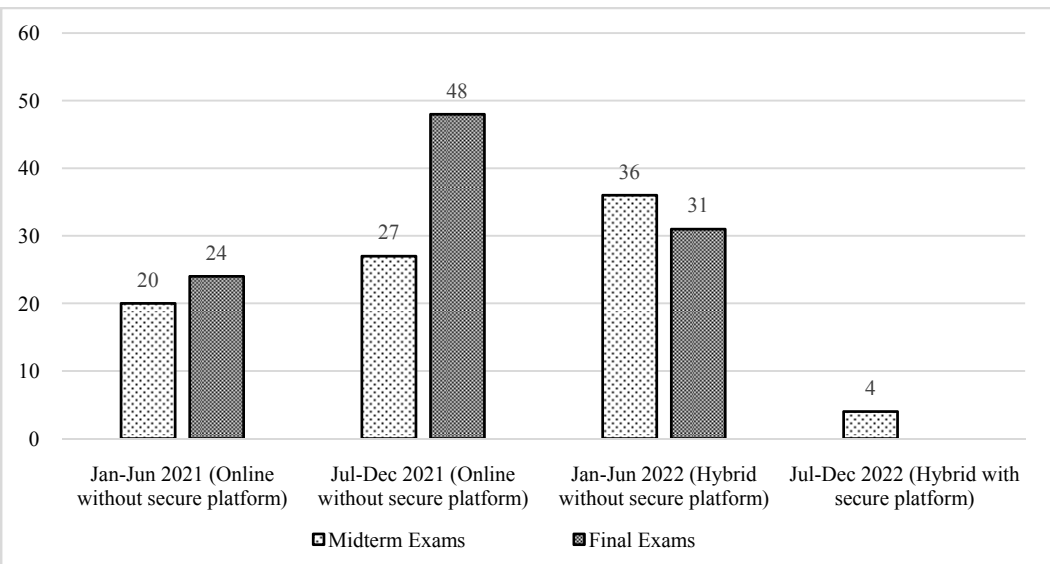

Figure 12.7: Number of Cheating Cases in Exams

Source: Secondary data compiled by the author.

The most common cheating behaviors reported were 'talking during the exam,' 'using unauthorized apps,' 'surfing the Internet,' 'having multiple IP addresses simultaneously,' 'receiving help from a third person hiding behind the screen,' 'using a share screen or extended screen function,' 'copying and pasting things,' or simply 'looking at something else away from the computer screen during the exam.' However, when a highly secure platform for online exams was applied, most of the cheating behaviors were preventable. The number of cheating cases dropped sharply to only four in the midterm exams conducted in the first half of July - December 2022. This success resulted from implementing a 'high secure platform' for online exams, which was an effort to prevent all kinds of cheating behaviors.

Unfortunately, the administration office said not all exams were on the 'high secure platform.' Due to the platform's limitations, some exams had to be on Google Forms and Google Spreadsheets. The 'high secure platform' was incompatible with some of the exams that included questions that required the students to answer using a spreadsheet or Excel. Thus, one of the forms of cheating during exams that was a big challenge for the administrators was when the exam was not on the 'highly secure platform' but instead on Google Forms or Google Spreadsheets, as revealed by the administration office. They uncovered that Google Forms or Google Spreadsheets could not restrict a unique account of the students taking the exams online, whether they were taking them from a distance or in the exam room. That means the students had a chance to provide the credentials of their account and were able to have a third party behind the scenes to help them write the exams simultaneously. At the same time, they were present on the cameras or physically in the exam room. On the other hand, zero cheating cases were reported during exams on the 'high secure platform.' The office admitted the capability of the 'high secure platform' that it was capable of securing the exam screen very safely, and more importantly, it was capable of restricting a unique credential of every student's account in such a way that only the student could access the exam. Thus, when the exam was on the 'high secure platform, neither the unique account of the student was accessible to more than one person, nor the unique account could be logged in simultaneously at the same time as in the case of Google Forms and Google Spreadsheets. Unfortunately, some exams were on Google Forms and Google Spreadsheets instead of the 'high secure platform' because the 'high secure platform' was incompatible with some of the exams that included questions that required the students to answer using a spreadsheet or Excel. Thus, the office had to use Google Forms and Google Spreadsheets as the platform, which could not do two things (securing the exam screen and restricting unique account access), which are considered the most important functions when administering online exams.

7. CONCLUSION

7.1 Summary of the Study

According to the study findings, there was an opportunity for the students who struggled to pass the course, as well as for the students who were lazy and struggled to pass, to act dishonestly in the online environment during both an online class and exam, provided that a strict procedure was not in place. Although everybody had an option not to open the camera during their online class for many reasons, the chance the students did not have to study during class was high. Similarly, it was also an opportunity for the students to act dishonestly during online exams. Although it was not as easy to cheat on an online exam as on a normal online class due to the strict procedures and rules in exams, the chance was still there. However, the possibility of cheating on an online exam would be reduced to a great extent, provided a secure platform for online exams could complement the implementation of the procedures and rules.

Academic misconduct, or cheating on assessments, exists in various forms, ranging from plagiarism, impersonation, fabrication, falsification, bribery, and others. Administrators face a significant challenge in administering student assessments, particularly exams, to ensure the integrity of every student's behavior. Invigilating online exams may even be a more substantial challenge, mainly when procedures and infrastructure such as invigilators, exam rules and procedures, exam platforms, and others are not in place or are inadequate.

Integrity, however, should cover more than concerns over plagiarism and cheating on student assessments such as exams, assignments, and other coursework-based assessments. The profound aspect of integrity should be about some other qualities behind those academic assessments. As commonly seen, every educational institution tries to instill it in students' behavior through content-based courses in the study program and academic disciplines during their academic journey with the institution. This places a significant responsibility on educators and administrators. Rules, regulations, and disciplinary actions against academic wrongdoings are critical in inculcating honesty and responsibility in the student's behavior. The most important thing about this is that honesty in a person's behavior is the depth of integrity instilled in them, and they should always uphold it throughout and beyond their academic life.

7.2 Implication of the Findings

The study implies that administrators may compromise the procedures if the infrastructure needed to ensure online exams is inadequate, which would affect the integrity of the exams. In a scenario, for instance, where the administrators, exam rules, and regulations for online exams are ready, but the main exam platform required

to complement those rules and regulations is not in place, it may result in the administrators compromising the integrity of the online assessment or exam to the best capability that they could manage within the limited time and resources at hand.

7.3 Study Recommendations

The administrators, instructors, and relevant stakeholders should consider some of the critical technical things to ensure the integrity of student assessments, such as exams conducted online. First, a simple and standard procedure for online exams for the students, administrators, and other stakeholders should be in place. Secondly, the rules and regulations for online exams should be simple, straightforward, strict, and fair to every student. This should mention precisely the consequences if anyone breaks the rules. Thirdly, an online exam platform that can prevent and detect fraud or cheating behaviors complementing the exam rules and regulations should be set up. Also, the study highly recommends a simple system, software, or online app. Lastly, a group of invigilators should be well-trained and well-equipped with the necessary skills for administering online exams.

7.4 Study Limitations

The study was not free from limitations. First, the study was confined to only one private, fee-charging higher educational institution. Therefore, study results should not necessarily be generalized to other institutions, particularly public universities with limited infrastructure and budgets. However, a comparable conclusion may be found in some of the fee-collecting higher learning institutions, which can ensure a considerably competitive study environment for targeted groups of students. Further attempts should be made in future studies to extend the scope of analysis to a broader context of higher learning institutions in Cambodia and outside Cambodia.

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CHAPTER 13

Exposure to Technology by Learners during COVID-19 and Its Benefits for their Careers in the Post-COVID-19 Context

Sita An and Phaneth Chheng

1. INTRODUCTION

The COVID-19 pandemic has caused significant changes across various sectors worldwide, notably affecting teaching and learning practices in education. In Cambodia, the pandemic presented numerous challenges for students and teachers, primarily due to the limited use of technology in classrooms. However, despite these obstacles, some educational institutions seized the opportunity to enhance their use of technology. At the same time, teachers sought innovative ways to facilitate learning and help students engage with new educational methods.

In reality, not all students could adapt to these sudden changes, prompting a need to examine the impact of technology on students and their ability to adjust to these advancements. This chapter also aims to identify the benefits of technology in supporting students' career development, particularly since many university students in Cambodia are balancing part-time jobs or internships with their studies. Our primary objectives are centered around a thorough investigation of these dynamics and the overarching impact of technological integration in education during and following the pandemic.

This chapter primarily aims to accomplish the following objectives:

1. To explore the impact of technology on student's learning during COVID-19.
2. To examine how students adapted to the changes in technology during this period.
3. To identify the technological benefits that assist students in their careers in the post-COVID-19 context.

The following section reviews the empirical studies in this direction. Following this, the chapter discusses the methodology used in this study. Subsequent sections present the empirical results and discussions, followed by the conclusion.

2. LITERATURE REVIEW

2.1 The Impact of Technology on Students during COVID-19

This section examines technology from a human perspective. Prior research has shown that people demonstrate two distinct reactions to introducing new technologies or digital transformations: one group is thrilled, while the other is curious and concerned. Higher education must feel obligated to provide the necessary infrastructure and technological tools for effective instruction. It is crucial for universities to recognize that digital transformation, which alters the overall university experience, requires establishing new conditions (Efimov & Lapteva, 2018).

No one can imagine their existence without digital technology in the present world, especially during and after the global pandemic. People utilize technology for work, study, and leisure. Critical technologies such as cloud computing can enhance this experience as the educational system rapidly approaches distance learning. Digital student employment and marketing have also evolved, allowing for remote supervision of distance learning, tutoring, and mentoring sessions (Jha & Shenoy, 2016). Unlike traditional methods that require students to be physically present at a university, students can now attend classes remotely.

Moreover, institutions can now effectively offer services and connect with a larger audience using digital marketing strategies. However, as digital technology advances, organizations and businesses operating internationally face increasing challenges in keeping pace with the disruptive market. This online competition extends to colleges and universities as well. Universities often spend significant money on the latest technology to attract as many students as possible. Leveraging sufficient digital technology can enhance the overall quality of graduates. Conversely, leading institutions may experience declines or collapse due to technological advancements (Crittenden *et al.*, 2019). This indicates that colleges risk losing their ability to attract sizable student populations if they do not adapt to technological changes.

Large institutions should prioritize this issue since technology plays a crucial role in education. Crittenden *et al.* (2019) noted that as more business operations become digital, communication channels have simplified, resulting in new ways for companies and customers to interact, often disrupting traditional marketing strategies. In an educational setting, careful planning is essential for developing and delivering online courses, and educators must possess the skills to blend classroom instruction with online learning effectively.

Although technology-integrated classes enhance the likelihood of active student participation in their education (Henry, 2008), the desire to incorporate technology in higher education extends beyond the classroom. Technologies such as artificial intelligence, augmented reality, blockchain, gamification, the Internet of Things (IoT),

and 3D printing have become essential for business-customer interactions, target marketing, and the overall marketing mix. For example, the customer support industry extensively uses artificial intelligence technologies.

Therefore, higher education institutions (HEIs) and universities should focus on these technologies to provide high-quality instruction and attract as many students as possible. By considering the rapid development of social media applications, the advancement of data analytics, the evolution of search engine optimization, and the proliferation of online e-businesses, we can glimpse the future of technology in education. Crittenden *et al.* (2019) assert that "it is imperative that college gain exposure to potentially disruptive, cutting-edge technologies, and more importantly, deeply ingrained the conceptional, inquiry, critical thinking, creativity, and integrative learning skills needed to enhance their future decision-making and human capabilities." This highlights the significance of digitization for students pursuing a university degree.

2.2 Student's Adaptation to the Changes in Technology during COVID-19

COVID-19 has ushered in a new era in education that impacts people's lives, and online learning is a trending kind of mainstream education. Thus, students must adjust to the latest learning mode, requiring them to alter their behavior to maintain or improve their performance. Adaptation refers to adjustments to society's needs, limits, and other factors, such as the capacity to live and work in harmony with others and to have pleasant social interactions and relationships. According to Al-Hawamleh *et al.* (2022), when students choose the online learning method, they rely on their professors' guidance and assistance, adversely affecting their self-regulation and autonomy. By using self-regulating learning processes, students would similarly try to adapt to online learning, but their inadequate strategies would not directly result in better marks. It is important to consider how students' adaptation to online learning will affect the development of their self-regulation throughout COVID-19. First, online learning forces students to adjust to the online environment. Students are forced to adapt to the new educational environment as they transition from traditional face-to-face learning to online learning, with these changes leading to varied degrees of self-regulation development.

As Dinsmore *et al.* (2008) explain, self-regulation is the process by which the environment influences an individual's awareness and regulatory response. This concept is particularly crucial in academic achievement, as it falls within the domain of self-regulated learning. Students must exercise self-control in the classroom to meet their learning objectives. The effectiveness of learners is determined by their use of the social cognitive learning approach of self-regulated learning. Schunk (2008) points out that while training and direction from external sources are essential for

teaching, the learner must also integrate this external influence into their self-regulation system. The COVID-19 pandemic has introduced new educational pressures that impact student growth in self-regulation. The adaptation to the new environment visibly influences the ongoing adjustment process.

2.3 Technology that Benefits Student's Future

The confirmation of COVID-19 has profoundly affected people's lives and daily routines, leading to the closure of schools at all levels, from elementary to university. In response, these institutions were compelled to swiftly transition from traditional classroom instruction to online teaching, facing significant challenges due to the abrupt nature of this shift and the lack of adequate preparation. Nevertheless, some schools view this transition as an opportunity to enhance students' technological skills and better equip them for their future careers (Oyedotun, 2020). Students have been introduced to various online platforms that transform their learning experiences and help them understand how to leverage technology for their educational benefit. Tools such as Zoom, Google Meet, and others have proven supportive of student learning, offering schools accessible and user-friendly options to facilitate this new mode of instruction (Oyedotun, 2020).

Integrating technology in the classroom has proven beneficial for both students and instructors during times of crisis, enabling the continuation of education while broadening perspectives on technological advancements. According to Winter *et al.* (2021), platforms such as "Zoom, YouTube, interactive video, PowerPoint, and Google Classroom" are deemed useful by students for their studies during such challenging periods and are likely to play a role in their future careers. Shenoy *et al.* (2020) also emphasize the effective use of these tools for teaching and learning, highlighting applications like Zoom, Google Hangouts, Skype, Google Classroom, and YouTube. Their findings indicate that, despite the online format, students utilized these platforms for class assessments, research, and presentations, underscoring a favorable attitude towards digital tools. Similarly, the Ministry of Education, Youth and Sport (MoEYS) has assembled a variety of online platforms, including its website, Facebook page, YouTube channel, and radio and television broadcasts, to facilitate learning (Sothy, 2021). Beyond using these digital tools for communication during instruction, schools ensured students had online access to materials and textbooks, either as digital copies or in soft format. This new experience has encouraged students to develop skills in navigating virtual classrooms, enabling them to appreciate the convenience of technology and effectively utilize the new tools provided by their schools.

Unexpected changes significantly impacted students, as many were unprepared to adapt to new technology. A key issue was that some students lacked sufficient

support at home, highlighting the essential role of parental assistance and school support in ensuring access to technology (Winter *et al.*, 2021). Additionally, the lack of Internet connectivity made it difficult for students to access online learning resources. Factors such as Internet speed and the availability of appropriate learning materials were critical for online learning, and there was a need for technical guidelines and support from schools (Sothy, 2021).

When technical problems arise, schools or teachers should be prepared to provide students with alternative solutions to resolve issues promptly. Therefore, having a reliable technical support system is a crucial strategy for tackling technological difficulties, even if developing or implementing these solutions takes time. Another important approach is to teach students how to engage with technology effectively and embrace change. Although this may influence their behavior or thought processes, students need to learn about modern technology in school to utilize it in the future. The skills and experiences gained during this time can benefit the education sector during the pandemic. As students apply them afterward, they can better prepare students and schools for similar situations (Lennox *et al.*, 2021).

Students who enhance their ability to adapt to technological changes gain a significant advantage over those with less technological experience (Bennett & McWhorter, 2021). Therefore, flexibility in adapting to technology is a crucial skill that dramatically benefits students. Furthermore, the advantages of technology help students use it more actively and retain these experiences for their future careers. In conclusion, the experiences students acquire during this period contribute to their flexibility and awareness of using technology effectively, preparing them for the demands of the modern workplace.

2.4 Key Debates and Controversies

The primary strategy used by governments to slow the spread of COVID-19 was to minimize physical contact, leading to the closure of educational institutions. Many students experienced unexpected delays in their education, and many who have not attended school in a year raised concerns about their educational situation (UNESCO, 2023). According to Maldonado and De Witte (2021), the school closures led to a combination of lost learning progress and learning loss, including rising inequality within and across schools. The learning losses during school closure were a concern that damaged students' learning and put them in a disadvantageous position (González & Bonal, 2021). The current studies have led to unequal learning in skills development and academic performance, which pushes students from advantages to disadvantages. Social class, cultural background, and age are factors that affect students' learning when adapting to changes during COVID-19 (Abadzi, 2009). Based on the situation, some students were not able to afford and make full

use of the technologies and, therefore, had to leave school; yet, those who had adapted and had full access to the technologies faced challenges in learning online since the culture of learning was primarily based on physical engagement and teaching.

Additionally, students were disadvantaged at socializing because they could not interact with their peers face-to-face as they used to in or outside the classroom. This created a problem that affected their learning and kept them from lively classroom engagement. Since everything was online, students might not be able to express their ideas fully, and there was less movement, which made the class less active and boring (Cattaneo *et al.*, 2017). Other controversies are that all of the technology platforms such as "e-book/e-journals, pdf documents, YouTube videos, online meetings (Zoom, Google Meet or Microsoft Teams), WhatsApp, social media (Facebook or Instagram), Google Classroom, e-mail, Google Search Engine, Podcasts, educational websites, Audio Calls, and PowerPoint Presentations" were introduced to the students, posed challenges for students in their learning. One of the challenges was the inexperience of new software and applications; students would require time to get used to the new software and apply the practice to their studies. In addition, there is a lack of knowledge of technology, especially for those from disadvantaged backgrounds who cannot obtain the necessary devices or internet connectivity (Rahiem, 2020). In some instances, parents had negative beliefs about the values and benefits of online learning, like Chinese parents who preferred traditional learning in early childhood settings (Dong *et al.*, 2020). According to Dong *et al.* (2020), due to the shortcomings of online learning, young children's inadequate self-regulation, and parents' lack of time and professional knowledge in supporting children's online learning, including the hardship caused by the COVID-19 pandemic, Chinese parents resisted and even rejected online learning at home.

All in all, these controversies bring concerns about students' learning losses and disadvantages during school closures. Social class, cultural background, and age can affect students' ability to adapt to online learning. Some may not have access to necessary technology devices, while others may struggle with the lack of physical engagement and social interaction. Moreover, inexperience with new software and applications was an issue for schools and students, along with the lack of technology knowledge, especially for children from poor backgrounds.

3. STUDY DESIGN AND METHODS

This descriptive research explores the impact of technology during COVID-19 on students' careers after the pandemic and examines whether online education can establish itself as the standard in the field.

The study employed both quantitative and qualitative methods to conduct the research. The target respondents were fourth-year students at a leading business

school in the capital city of Cambodia. We surveyed the sample respondents online using Google Forms, focusing on the impact of technology on students' learning during COVID-19. Through the qualitative approach, we gained more profound insights into how students adapted to technological changes during the pandemic and identified the benefits of technology that supported their careers after the crisis.

The study's sample size was determined using the Yemen (1967) formula. For the total population (N) of 315, we calculated the study's sample size as 124 with a 0.07 margin of error. Further, based on the gender representation in the total population, we randomly selected 67 percent of female students (n = 84) and 33 percent of male students (n = 40) using a lottery method for the online survey.

A semi-structured questionnaire was created to collect primary data from the sample respondents. The questionnaire was pre-tested with a small group of selected students and revised based on their feedback. We then distributed the final version to the target respondents and asked them to complete the online survey using Google Forms. Additionally, we conducted online focus group discussions with study participants who expressed interest in participating. All ethical guidelines were adhered to throughout the study.

4. RESULTS AND DISCUSSIONS

4.1 Using Technology in Learning during COVID-19 Pandemic

Familiarity and Usefulness of Using Technology

The survey showed that all respondents were familiar with using technology in their learning. However, around 60 percent of participants believed that technology was beneficial to their studies, while the remaining 40 percent found it moderately helpful. From the responses, we inferred that technology significantly impacts learners' ability to learn, contributing to improved academic performance. Participants agreed that technology offers a convenient way to study. One respondent stated, "It is easy and faster to search for information and review through video recordings, which helps us learn new skills and understand new technology." Others mentioned, "Using platforms like Zoom or Google Meet has made online studying easier; without technology, we wouldn't be able to learn the lessons in a timely manner."

Impact of Technology on Study

The survey revealed that 83 percent of respondents either agreed or strongly agreed that technology has positively impacted their education and enhanced their studies. However, 17 percent of participants chose to remain neutral on the matter. This

suggests that most respondents feel they have benefited from using technology in their studies. Respondents highlighted various advantages, including: "It makes communication and teamwork easier," "It creates a more engaging learning environment," and "It allows for sharing ideas and opinions through images and videos, as well as having clearer video recordings for reviewing lessons."

Accessibility to an Online Learning Platform

The study assessed respondents' accessibility to online learning platforms such as Zoom video conferencing, Google Meet, and other Google applications that assist them in their studies. Seven among 10 respondents (around 70 percent) felt these platforms were either strongly accessible or accessible. However, one-fifth of them considered the accessibility only moderate, and nearly 10 percent experienced it as slightly accessible, indicating potential issues with their Internet connectivity. Overall, respondents were able to access the online learning platforms when needed for their studies.

Adaptation to Online Learning

The respondents who engaged in online learning exhibited various strategies for adapting to their virtual educational environment, highlighting the diversity and complexity inherent in the learning process. Over two-fifths of the study participants (43.5 percent) acknowledged that essential tools, including a reliable laptop, earphones, a microphone, and stable Internet connectivity, play a crucial role in adapting to online learning. In contrast, nearly one-third (30.4 percent) of respondents emphasized the importance of having a conducive learning environment, such as a quiet space. Additionally, some participants indicated that practicing during class hours (17.4 percent) and seeking assistance from peers, lecturers, and support staff (8.7 percent) were other effective methods for adapting to the online learning experience. While learners employ different strategies to adapt, possessing the right tools and a suitable environment is fundamental to enhancing the online learning experience.

Knowledge in Using Online Learning Platforms

The study reveals that most respondents were familiar with online learning platforms for their education. About 70.0 percent found platforms like Zoom and Google Classroom to be very easy or easy to use, while the rest felt it was moderately difficult. Overall, most respondents demonstrated a good understanding of how to navigate online learning platforms.

Factors Contributing to EffectivOnline Learning

Study participants shared their thoughts on what factors contributed to their successful online learning experiences. Nearly two-fifths (39.0 percent) of respondents strongly believed that most students showed interest in online learning as they saved their time by not commuting during the pandemic and felt comfortable studying at home. Another significant factor was the ability to ask instructors questions without hesitation, which was noted by 31.0 percent of participants who felt less judged compared to traditional classroom settings. Additionally, 17.0 percent mentioned that having presentation slides on their screens and clearly hearing the lecture (13 percent) benefited their learning experience.

However, respondents also identified several challenges in the online learning process, including slow Internet speeds, a lack of motivation due to the absence of face-to-face interactions, and a lack of learning environments at home.

4.2 Benefits of Using Technology in Contributing to Students' Career

This study aims to investigate how the online learning technologies adopted by students during the pandemic contribute to their career development afterward. The research highlights various learning platforms used, including Zoom, Google Meet, Google Forms, Google Classroom, Kahoot, and Google applications such as Google Docs and Google Sheets. Most respondents identified Google Classroom, Google Forms, Google Applications, and Kahoot as the most beneficial tools (Figure 13.1).

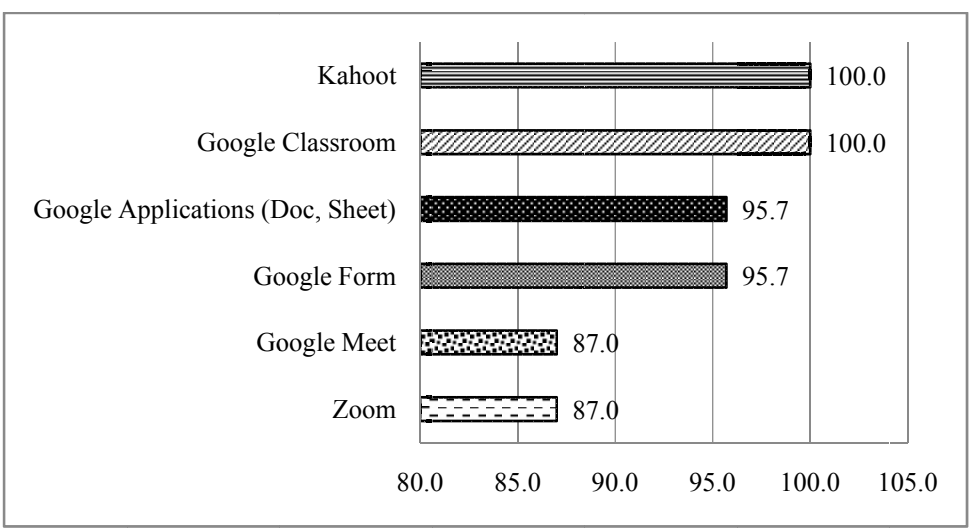

Figure 13.1: Beneficial Apps/Web-Based Technology in Learning (%)

Source: Primary data compiled by the author.

The respondents, who have been immersed in the world of learning technology since their time at a private institution, have found great satisfaction in the practical application of technology. While not all students were initially familiar with platforms like Zoom or Google Meet, the shift to online classes during the pandemic has seen them quickly mastering these tools. When asked about the primary benefits of using technology, eight out of ten respondents identified several advantages: it saves time, provides convenient access to online materials anytime and anywhere, and makes it easier to research specific lessons or topics. Additionally, one-fifth of the respondents mentioned that technology enhances their learning experience by making it more enjoyable and engaging. They noted that it helps them acquire new skills and knowledge, gain a better understanding through practical application, and improve their communication skills and overall performance in school and the workplace.

As students are introduced to new technology, they must learn to adapt and pay close attention to these changes. Despite this challenge, students generally view technological advancements positively. They reported gaining new skills and knowledge that have helped improve their soft skills. Additionally, their experiences with online learning have given them a significant advantage, as they are likely to use platforms like Zoom or Google Meet for discussions in their future workplaces.

Furthermore, Google applications have enabled them to effectively utilize various tools for their studies and work. Google Classroom is an essential resource for students, as most assessments and materials are stored in these applications, allowing them easy access. Kahoot, an engaging app, is used in every session for quizzes and slide presentations, making it enjoyable for students to answer questions. However, while these tools enhance the learning experience, they may not significantly benefit students' careers unless their future jobs involve training, instruction, or lecturing. Nonetheless, providing students access to software and applications is crucial for their academic experience. Continuing to utilize these tools could greatly benefit them in the future.

5. CONCLUSION AND RECOMMENDATIONS

A substantial body of theoretical and empirical research supports the direct and indirect relationships between the use of technology—such as online learning—and learner performance and adaptation. Numerous studies have thoroughly examined the role of technology in enhancing the quality of education. Institutional management must recognize the need to invest in technology, particularly online learning tools and high-speed Internet, to enhance educational quality and provide greater flexibility for learners.

Our research indicates that the study institution has diligently equipped learners with the necessary skills, technology, and tools to adapt to significant changes in the learning environment. The practical skills acquired through technology will aid learners in adapting to future technological advancements and greatly benefit their

career prospects. This ease of adapting to new technology highlights the advantages of using technology in education during the COVID-19 pandemic. It reassures the continued relevance of this investment to learners' careers in the post-pandemic context.

The respondents in this study were selected from a private higher education institution, limiting the findings' generalizability. Additionally, the study did not include important participants such as instructors, management, non-academic staff, and others. Therefore, there is potential to expand the scope of this research.

Based on the findings, the study intends to provide the following recommendations:

1. Although the study institution has adequate infrastructure to adapt to the changing learning environment, it should consider reviewing and implementing newer technologies to enhance students' learning experiences.
2. Given the post-pandemic context, the institution could offer students the flexibility to choose between online and in-person classes. This option would be especially beneficial for students traveling long distances to attend classes.
3. The institution's proactive approach to researching new technologies, particularly educational tools that facilitate learning, should reassure stakeholders of its commitment to continuous improvement.
4. It is crucial for the institution to establish a continuous feedback mechanism for learners. This will enable them to share their thoughts and experiences regarding the technologies provided, ensuring that their needs and preferences are considered in the ongoing enhancement of the learning environment.

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Subject Index

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The world witnessed the adverse economic shocks of the global pandemic, which had a devastating impact on the lives of millions. The economic downturn pulled the country's growth and increased poverty levels. While the extent of the effects varied across countries, a closer look into the economic and social conditions, including macroeconomic variables, before, during, and after the COVID-19 pandemic was felt necessary for identifying practical remedies and charting a viable path to recovery. In this context, the research-based discussion papers presented at the annual international research symposiums hosted by CamEd Business School contributed to the development of this book.

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ISBN 978-93-90951-81-9

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