Journal of Tourism Quarterly Research Article
ISSN 2689-2294 (Online) 2021, 3(4), 215-234

A Critical Analysis on Reviving the Tourism Industry in Bangladesh after Covid-19

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Abstract

The aim of this paper is to critically analyse the pathway for reviving Bangladesh's tourism industry. By using Computable General Equilibrium Modelling (CGE) approach, we find that tourism industry of Bangladesh is heavily affected by the Covid-19 pandemic apart readymade garments, health, education, and some other service and manufacturing industries. Besides, within the tourism industry, impact of accommodation services is considerably high with 34.2% reduction of sectoral output. Government stimulus packages have been found to be effective in mitigating the sudden Covid-19 shock. However, we show that targeted government expenditures (stimulus packages and other explicit expenditures) rather than only government stimulus packages bring a win-win situation not only for tourism industry but for the country as well. We argue that institutional integrity along with the policy suggestions derived from the analysis are essential to help the tourism industry of Bangladesh to bounce back on the original growth trajectory in the post Covid-19 era.

Keywords: Tourism; Bangladesh; Covid-19; Government Expenditure; CGE Institutional Integrity

1. Introduction

The stunning beauty of nature, varied civilizations, and different sorts of people and their lives, hypnotic landscapes and portraits, similarly attractive motels and hotels, and delectable culinary items of distinctive regions are the first things that come to mind when we hear the word "tourism." In this modern era of globalisation, the tourism industry has emerged as a potential medium of social and economic networks within and beyond the national boundaries. Because of its linkages with different economic activities, tourism industry is regarded as one of the versatile industries. Furthermore, according to the World Tourism Organization (UNWTO, 2019), after chemicals and fuels, tourism industry is considered as the 3rd largest industry in the world. Besides, World Travel & Tourism Council (WTTC, 2019) highlights that the industry contributed 10.4% (8.52 USD trillion) of the global GDP in 2018, and the share is expected to reach 11.5% by 2029. Tourism also contributes to job creation; since 2013, it has accounted for roughly 20% of global employment (UNWTO, 2019). On the other hand, tourism also enhances privatisation and increases competition and efficiency (Amin and Rahman, 2019; Lin et al., 2018; Zhang and Yang, 2018; Zhang and Zhang, 2020). This happens due to the tourism industry's inherent nature, offering a rational ground for commercial concentration. Its component segments of transport, accommodation, entertainment, food, and beverages are intently cohesive over the consumption arrays of travellers.

Bangladesh is home to a plethora of tourism attractions. The country's tourist attractions are boundless, from the world's longest sea beach to mangrove forests and magnificent rivers. To refresh their brains and take a brief break from their everyday frantic lives, tourists can spend days on the beach in Cox's Bazar-the world's largest sandy sea beach, take tours in the Ratargul Swamp Forest, or even spend a few days in Bandarban or in the valleys of tea garden in Sylhet. The tourism industry started to get momentum in Bangladesh from roughly around 2007, which is evident from the steady increase in the tourism industry's total contribution in GDP. On average (2007-2018), the total tourism contribution was 377.46 billion Bangladeshi Taka (BDT). However, in 2018, tourism's total contribution stood at 693.21 billion BDT. In the last five years, the total contribution of tourism to GDP increased at a higher speed. It is because, from 2007 to 2013, the average growth rate of tourism's total contribution was 11.26%, while it was 14.27% from 2014-2018. In 2018, direct employment generation in Bangladesh was 599 thousand persons, while indirect and induced employment was 1,227 thousand persons. From 2007 to 2018, the average employment generation from direct, indirect and induced were 530 thousand and 1,121 thousand (WTTC, 2019). Also, according to the World Bank (2020), Bangladesh saw gradual increase in average tourism receipts from 2013 onwards due to the revised national tourism policy adopted in 2010.

Imagine a machine that is running smoothly, following its directions, and producing 50000 units of a good per day, until something goes wrong and the entire machine breaks down, resulting in no goods being produced. When the infamous coronavirus, also known as Covid-19, entered our life, something similar occurred. The presence of the virus spread like wildfire, turning the Chinese outbreak into a global pandemic. In Bangladesh, the first Covid-19 report was confirmed on March 8, 2020. Since then, the number of affected increased rapidly. Bangladesh has reported 1.0 million infection cases and 20,467 deaths till 30th July 2021. Because of tight government limitations and quarantine regulations, like many other countries (such as Indonesia, Thailand, India, Maldives, Fiji, Bahamas, etc.) the tourism industry has been hurt the most compared to other industries. Form the estimates of Twining and McComb (2020), the impact of Covid-19 pandemic on the growing tourism industry of Bangladesh was predicted to be around 2.03 billion USD loss in the GDP. It was also highlighted that about 420,000 million jobs were at risk of which more than 80% are informal, leading to negative impact on the country's progressive socio-economic improvement.

Rebuilding an economy after a devastating pandemic outbreak may appear to be a challenging; but Bangladesh is doing well due to the adoption of “V” shaped recovery plan. The backbone of the intended “V” shaped recovery plan was the well-structured relevant stimulus packages along with detailed coordination mechanisms and good governance. The decision of gradual resumption of economic activities, coordination mechanisms, effective stimulus packages, and good governance are indeed helping the economy of Bangladesh to quickly revive its old state, which is undeniably analogues to the predictions made by the Bangladeshi government. Given the distinct feature of the tourism industry, we argue industry specific policies are needed. Since Bangladesh economy is still in recovery period and international tourism is in total halt, focus on domestic tourism activities given all the health measures are ensured can help the industry to jump start from idle state and slowly start its journey towards previous trajectory.

Given the lack of discussion on the strategic planning for reviving the tourism industry in the existing literature from Bangladesh's perspective, the main aim of this paper is to explicitly analyse the post Covid-19 sustainable way forward for Bangladesh's tourism industry through policy experimentations with the help of robust quantitative modelling technique.

The novelty of this paper is twofold. First, this is the first paper that applies carefully designed Computable General Equilibrium (CGE) Model to conduct policy experimentations for Bangladesh's tourism industry by augmenting Covid-19 and impacts of government responses. The model is calibrated with the recent Social Accounting Matrix (SAM) of 86 commodities and 86 activities, including disaggregated tourism industry

given Bangladesh's national accounting strategy. It is worth mentioning that CGE is one of the robust and widely acknowledged modelling approach for analysing macroeconomic impact of different shocks (financial, environment, employment, productivity, etc.) in the tourism industry for policy design and implementation (Li et al., 2010; Frent, 2016; Patt and Alizadeh, 2017; Zhang and Zhang, 2020; Inchausti-Sintes et al., 2021; Inchausti-Sintes, 2020). Second, based on the results, we provide policy suggestions for sustainable tourism industry development in Bangladesh.

In terms of sectoral output, our results indicate that the impact of Covid-19 is considerably higher in the accommodation sub-sector (-32.4%) than other two sub-sectors, namely transportation and storage (-15.6%) and restaurants and food services (-18.4%). We further find that even though the government response improves the overall situation; however, targeted government expenditures for the tourism industry brings the win-win situation for both the tourism industry as well Bangladesh economy by enhancing tourism demand in the domestic market through different transmission channels.

The rest of the paper has the following structure. Section two briefly discusses the relevant literature. Section 3 presents the CGE methodology followed by results and discussions in section 4. Finally section 5 brings conclusion of the paper with key policy suggestions.

2. Literature Review

The existing empirical literature shows ample of analysis regarding the tourism-growth nexus. Many literatures reveal that the expansion of tourism-related activities stimulates the economy directly and indirectly (Balsalobre et al., 2020; Amin et al. 2020; Brida et al., 2016). Tourism activities within a particular economy promote household income, reduce poverty as well as generate government revenue with a multiplier effect (Rasool et al., 2021). There is also evidence regarding improvements in the balance of payment and local investment for infrastructure facilities due to tourism development (Celik et al. 2013). Amin (2021) mentions that tourism promotes infrastructural development and other facilities. It is observed that for some economies or regions; there is a presence of economy-led tourism hypothesis and neutrality hypothesis (Antonakakis et al., 2016).

Although the tourism industry's development leads to higher economic growth, some studies argue that the development of the tourism-specialised countries tend to be slower than the non-tourism industry specialised countries (Ghalia and Fidrmuc, 2015). One of the main reasons is low productivity growth in the tourism industry due to the lower technology intensity (Sequeira and Maças, 2008). On the contrary, Brau et al. (2007) show that small open economies specialising in tourism grow faster than other large countries but vulnerable to international trade shocks.

Socio-economic aspects are aspects that emphasizes on the relationship between social behaviour and economics (. Tourism industry is found to be related with socio-economic development. For instance, it has been found that tourism development has a strong correlation with the socio-economic development of the local communities of Cox's Bazar of Bangladesh, which known for the largest unbroken sandy beach (Amin et al. 2019). According to Sadi et al. (2010), interaction with immigrant workers and tourists bring about significant changes in the social structure. These social and cultural impacts can have various impacts on the behaviour, lifestyle and quality of life of the inhabitants or the local people of the tourist areas (Gursoy et al., 2019). However, if tourism is helping to improve these aspects, it also contributes to the destruction of the moral or cultural norms of the society (Gursoy et al., 2019). On the other hand, it can also bring about newer ideas through exchanges between the local people and the tourists. For a country like Botswana, tourism brings about many employment opportunities to local communities which therefore have a multiplier effect on their

economy (Mbaiwa, 2003). However, detrimental effects tourism has on the environment such as noise pollution and poor waste management are also mentioned (Mbaiwa, 2003).

Sometimes, instead of getting visas and booking flights for countries overseas, travellers may choose to explore places in their own country. Domestic tourists are people who travel in their own country of residence. There are various benefits of domestic tourism for a country. According to the statistics of WTTC (2019), 73% of total travel and tourism was domestic in 2018. This gives us a hint that there are hundreds of people who love travelling in numerous tourist spots in their own country. For example, in 2018, China saw 764 billion USD as revenue from domestic tourism.

It is worth noting that domestic tourism has a significant impact on Bangladesh too. Bangladesh is home to many natural treasures. For example, lakes, beaches, hills, forests, wildlife, tribal life, historical monuments, cultural, and religious heritages. Due to the global pandemic, Bangladesh was one of the countries who has been affected severely in the tourism sector. Sylhet, Chittagong, Cox's Bazar, Nijum Deep, Saint Martin, Lalakhal, Ratargul, Bandarbans and many other tourist attractions are the reasons why 10 million people choose domestic tourism in Bangladesh every year.

The Covid-19 pandemic forced countries around the world to impose travel restrictions, close national borders and introduce lockdowns and quarantine periods, all of which led to a significant decline in international and domestic tourism for weeks (Gössling et al., 2020). In March 2020, the UNWTO had estimated that the pandemic would cause a 20% to 30% decline in international arrivals (Gössling et al., 2020). Due to the number of global flights being cancelled, flight plans were reduced to more than 50% by the airline industry (Uğur and Akbıyık, 2020). In Canada, the number of flights arriving from other countries in March 2020 was 54.2% less compared to February 2020 and hotel occupancy was less than 20% within the first week of April 2020 (Liu, 2020). Around the world, hotel bookings and tourist activities were being cancelled (Gössling et al., 2020).

The tourism industry relies heavily on human mobility and interaction, so pandemics and other infectious disease outbreaks threaten the whole industry (Yang et al., 2020). Tourism is a rising industry in Bangladesh and has been hit hard by the pandemic. The Tour Operator Association of Bangladesh (TOAB) predicted that the travel and tourism sector of Bangladesh is predicted to lose up to $710 million if there is no change in the situation. A total of 698 international and domestic flights were cancelled by Biman Bangladesh Airlines and average occupancy rates of luxury hotels fell to 30% due to the pandemic (Haque, 2021). Due to an increase in Covid-19 cases again, certain countries are banning visiting tourists from other countries in fear that they may help spread the virus, such as the UK which banned inbound tourism from Bangladesh, India, etc. New Zealand travel restrictions strictly state that the country is not open for tourism or foreigners while Bangladesh travel restrictions state that the country is partially open for both.

3. Methodology and Data

The main of this section is to provide a detailed overview of the Computable General Equilibrium Modelling (CGE) approach given the objective of the paper. The section is divided into two sub-sections. The first sub-section discusses structure of the Social Accounting Matrix (SAM). The second sub-section provides an overview of the main features of the CGE model used in this paper.

3.1 The SAM

According to the definition of the United Nations (2009), the SAM is a representation of national accounts that follows the criteria provided by the system of national accounts. In a more general way, SAM can be

considered as a holistic technique for representing economy-wide data. In technical terms, a SAM is a square matrix, where each account is showed with the help of a column and row. Incomes are showed by rows and expenditures are showed by columns. The underlying idea behind such set up is the equalisation of total revenue and total expenditure.

We use Bangladesh's recent SAM for conducting a series of simulation analysis. The recent SAM of 2018 has been prepared by applying RAS algorithm to adjust for 2018 from the base year 2016 (Meng, 2014 and Parikh, 1979).In this SAM, the Bangladesh economy is structured by 86 production sectors with their respective commodity sectors. Production and commodity sectors are divided into three categories, namely, agricultural sectors and products, industrial sectors and products, and service sectors and products. Tourism industry falls under the service sectors and products. For the analysis, we disaggregate the tourism industry into three sub-sectors: transportation and storage, accommodation, restaurants and food services, following the approach of the national statistics calculation used by the Bangladesh Bureau of Statistics (BBS). Other than production and commodity sectors, SAM includes government account, foreign account, tax account (direct and indirect), household account, and factor account. Table 1 shows the macroeconomic background of Bangladesh economy.

Table 1. Macroeconomic Background of Bangladesh Economy from SAM

Broad Sectors	Sectoral Share (%)	Consumption Share (%)
Crops	8.42	13.33
Livestock	2.20	5.92
Forestry	1.33	1.51
Fisheries	4.34	9.24
Mining	1.76	--
Manufacturing	17.15	31.37
Other Industry	9.19	4.67
Services	55.62	33.76
Total	100	100

Source: Bangladesh SAM

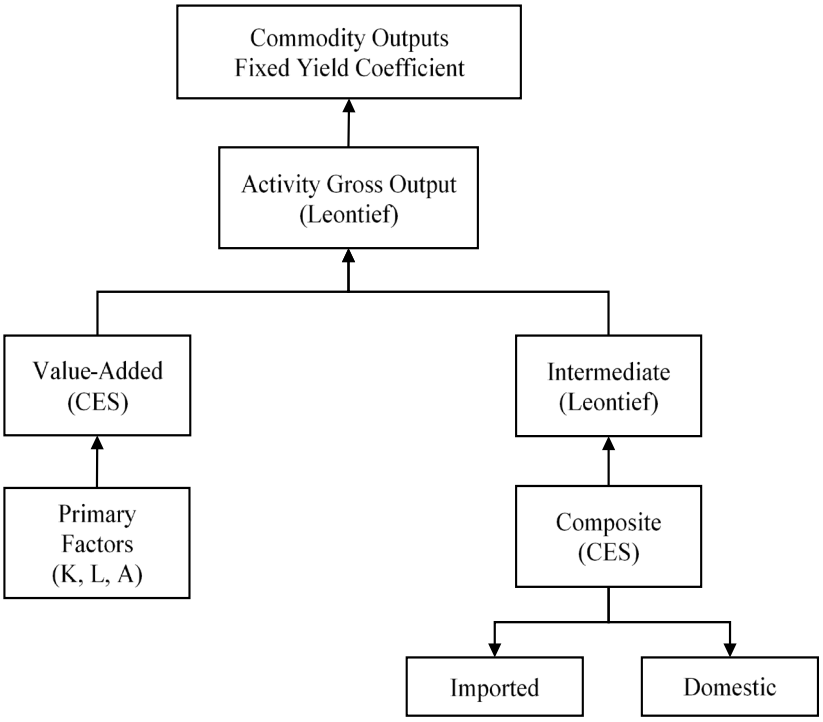
3.2 The Model

The CGE model used in the paper can explain all the payments recoded in the SAM. As a result, it should be noted that the model follows each disaggregation related to commodities, producers, factors, and institutions listed in the SAM for calculations. The proposed model has a close association with the production structure used in Timilsina and Pargal (2020). Every producer (captured by activity) maximises profit by taking the difference between total revenue and total cost of factors and intermediate goods given the available technology. It is worth noting that the process depends on a nested structure (**Figure 1**). The upper most technology is identified by the Leontief function to ensure fixed share. The value added in this model follows Constant Elasticity Substitution (CES) function. On the other hand, Leontief function characterises the disaggregated intermediate inputs in the model (unaffected by price changes).

We consider households as “representative households”. Households are divided into two major groups, namely urban households and rural households. All households are further divided into 5 quantile. The rural households are also separated into two sub-groups, namely farm households and non-farm households following the criteria used in Bangladesh's recent Household Income Expenditure Survey (HIES), published in 2016. In the model, household consumption pattern from different activities is structured by Linear Expenditure System (LES). Additionally, households utility does not solely depend on consumption of goods and services as mentioned in many existing literature (such as: Solaymani and Kari, 2014; Glomm and Jung,

2015) but also determined by savings (i.e. different between present and future consumption), factor prices, government transfers, and taxes.

Figure 1. Production Technology Structure



Source: Authors' own elaboration

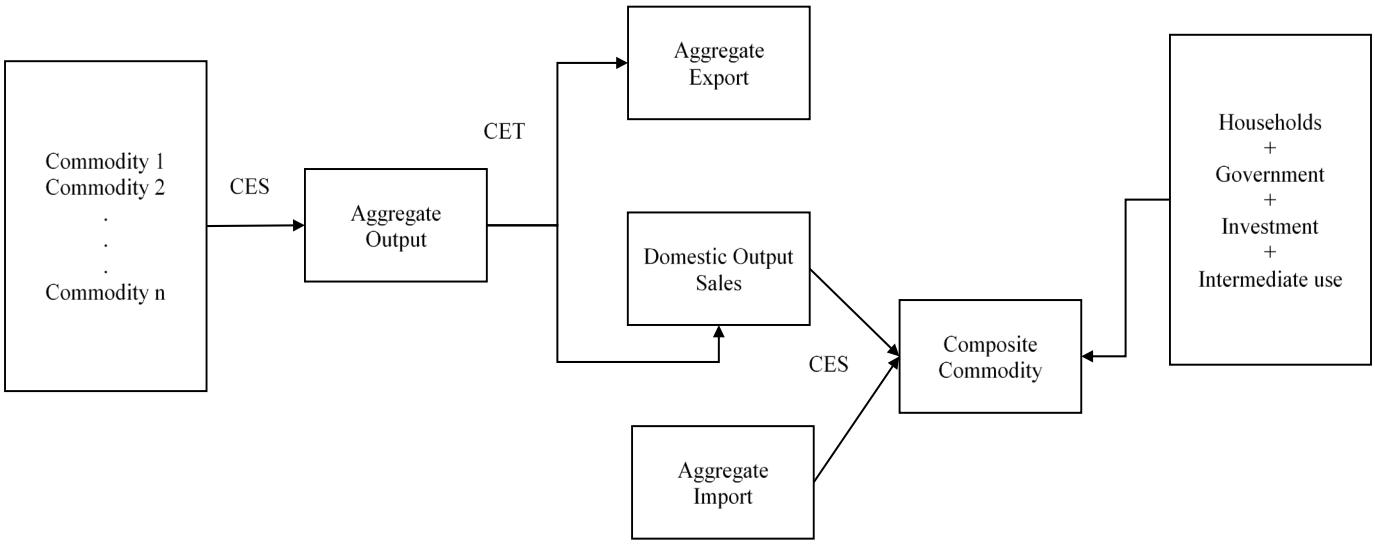
Representation of the government account is immensely important in this paper. It is because the simulations will be based on government response to the Covid-19 pandemic through different channels. In the model, government is responsible for collecting taxes and providing subsidies. It can save the income from the taxes as well as from other channels. Government can use the income to purchase commodities and can also make cash transfers to the households and industries. It is worth mentioning that the taxes are fixed ad valorem rates. On the other hand, transfer from the foreign account to domestic accounts (like household and government) is fixed in foreign currency. We also define current account (i.e. foreign savings) as the subtraction of foreign expenditure and receipts.

All the domestically produced goods and services enter in the different markets; however, we assume that home-consumed outputs are restricted to enter in the markets. Beside the domestically produced goods and services, imported goods and services also enter in the markets. Moreover, the marketed domestic goods and services are assumed to be imperfectly substitutable due to differences in quality, distance between locations and time of production. For aggregation of domestic goods and services of every markets, we use a CES function. It is important to point out that activity-specific prices clear the implicit market for every disaggregated goods and services. The aggregate domestic output is grouped intro domestic sales and export, which are subject to imperfect transmutation and expressed with Constant Elasticity of Transformation (CET) functional structure. Export demands respond to the international prices following the assumption of Timilsina

and Shrestha (2007). On the other hand, import depends on international market supplies as well as lack of domestic production. Domestic output and imports make the composite commodity that is captured by a CES aggregation function, where they are imperfectly substitutable. The demand for composite commodity comes from different channels such as households, government consumption, investment, and intermediate use. Needless to say, restricting perfect substitution and transformation makes the model to reflect empirical realities existing in the economy. The chain process can be showed by Figure 2.

We assume that total labour demand in the economy follows the Walras law. We also make further assumptions on factors and other macroeconomic closures by following the past papers CGE modelling in Bangladesh and other developing countries. First, we assume capital is fully utilised but its mobility is activity specific. Second, labours are fully employed and mobile. It is also worth noting that labours are disaggregated both in terms of locality and education attainment. Third, CPI is flexible. Fourth, investment in the economy is savings driven. Fifth, exchange rate is fixed but foreign savings are flexible. Since elasticity parameters of substitutions across the sectors are difficult to empirically estimate, following the norm in the literature, we obtain elasticity parameters different studies (Amin et al., 2021; Timilsina and Pargal, 2020).

Figure 2. Marketed Commodity Flow



Source: Authors' own elaboration

4 Results and Discussions

We start this section by discussing CGE simulation results of the key sectoral output followed by commodity demand analysis of the tourism industry in Bangladesh, and finally, overall macroeconomic situation after each shock is absorbed by the economy. The simulations are designed upon three types of shocks, namely i)

Covid-19 shock on Bangladesh economy, ii) Covid-19 and stimulus package shock, and iii) Covid-19, stimulus package, and targeted government expenditure shock. A series of sensitivity analysis has been carried out by changing the factor substitution elasticities and household income elasticities. According to the sensitivity results, there has been no change in the direction of the shock effect. Also the differences in the shock effects are minimal in most of the cases.

4.1 Sectoral Output Analysis

4.1.1 Covid-19 and Bangladesh Economy

A shock in an economy is an unexpected event that causes either a positive or negative effect in the economy. The Covid-19 pandemic, caused by the worldwide spread of coronavirus, is a negative shock to the economy of Bangladesh as it led the government to impose full lockdown from the last week of March till end of July. Consequently, economic activity plummeted and unemployment saw adverse effects (Amin et al., 2021). In addition, wage rates got reduced for different types of labour depending on their level of education and locality (i.e. rural and urban), which can be seen in the findings of different surveys done during the pandemic (for example: BIGD, 2020). So, the designed factor availability for the first simulation (SIM1) assumed a 50% reduction in factor availability (labour). Furthermore, the factor wage rates are decreased by different magnitudes depending on the education attainment and locality (10% to 30%). For instance, if education of labour is high, then the reduction of wage rate is low and vice versa.

In Figure 3, we see the results of SIM1, where all sectors taken into account are shown to have relatively large negative impacts due to the Covid-19 pandemic. The textile, clothing and leather industry is hit the hardest and sectoral output falls by 53.3%. It is worth mentioning that it is the leading exports industry of Bangladesh, and the cancellation of international flights due to Covid-19 lead countries to stop trade during the full lockdown. This led to the sharp decline in exports quantity, leading to a reduction in sectoral value added. Overall manufacturing also falls by 35.2%. Furthermore, sectoral output of education reduces by 40.9% as institutions such as schools, colleges, universities, and other educational institutes have been closed to prevent the spread of the Covid-19. Similarly, tourism industry has also been impacted heavily as it is evident from accommodation's output declines by 34.2%, transportation and storage by 15.6%, and restaurants and food services by 18.4%. A large portion of this is due to a lack of tourists and travellers, especially on an international level.

4.1.2 Covid-19 and Stimulus Packages in Bangladesh

In the second simulation (SIM2), stimulus packages are being considered to design the shock process. The government of The People's Republic of Bangladesh (GOB) adopted and distributed stimulus packages across the economy while imposing partial lockdown to help businesses to survive. With the combination of monetary and fiscal policy measures, the government of Bangladesh announced economic stimulus packages of 1.03 BDT trillion (Raihan, 2020). The quick response of the government during the crisis is evaluated as a timely decision that indicates the exercise of good governance in Bangladesh. The stimulus packages has been planned for a fast “V” shaped recovery from the economic crisis by targeting mainly four orientations such as export-oriented industries, agriculture sector, low-income group, and affected businesses. It is worth mentioning that the stimulus packages are highly skewed in terms of liquidity instruments (80.7%) rather than fiscal instruments (19.3%). The stimulus packages mostly contained working capital loans, refinance schemes, subsidies, reduction in interest rates, budgetary support for paying the wage bills, etc. for businesses keep continuing production instead of completely shutting down and facing tremendous losses. We design the SIM2 by introducing a 20% reduction in factor availability instead of the 50% from the first simulation, as more workers are able to travel to work now in accordance with social distancing rules. Also, wage rates of different

types of labours are now redefined moderate reduction (10%-15%). Finally, stimulus packages depending on the priority of the sectors as mentioned by the government are injected into the model.

Figure 3. Effects of Covid-19 in Bangladesh Economy

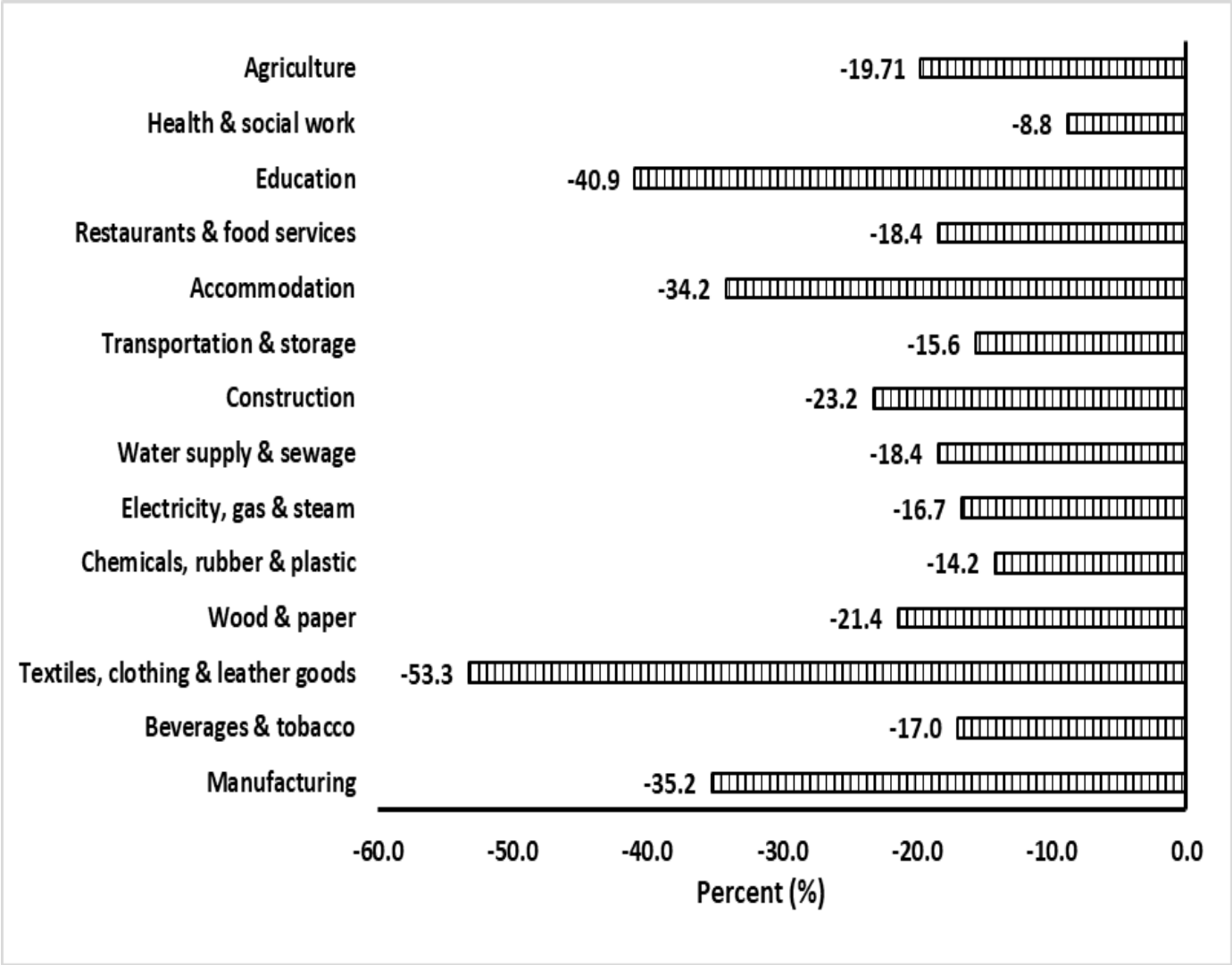
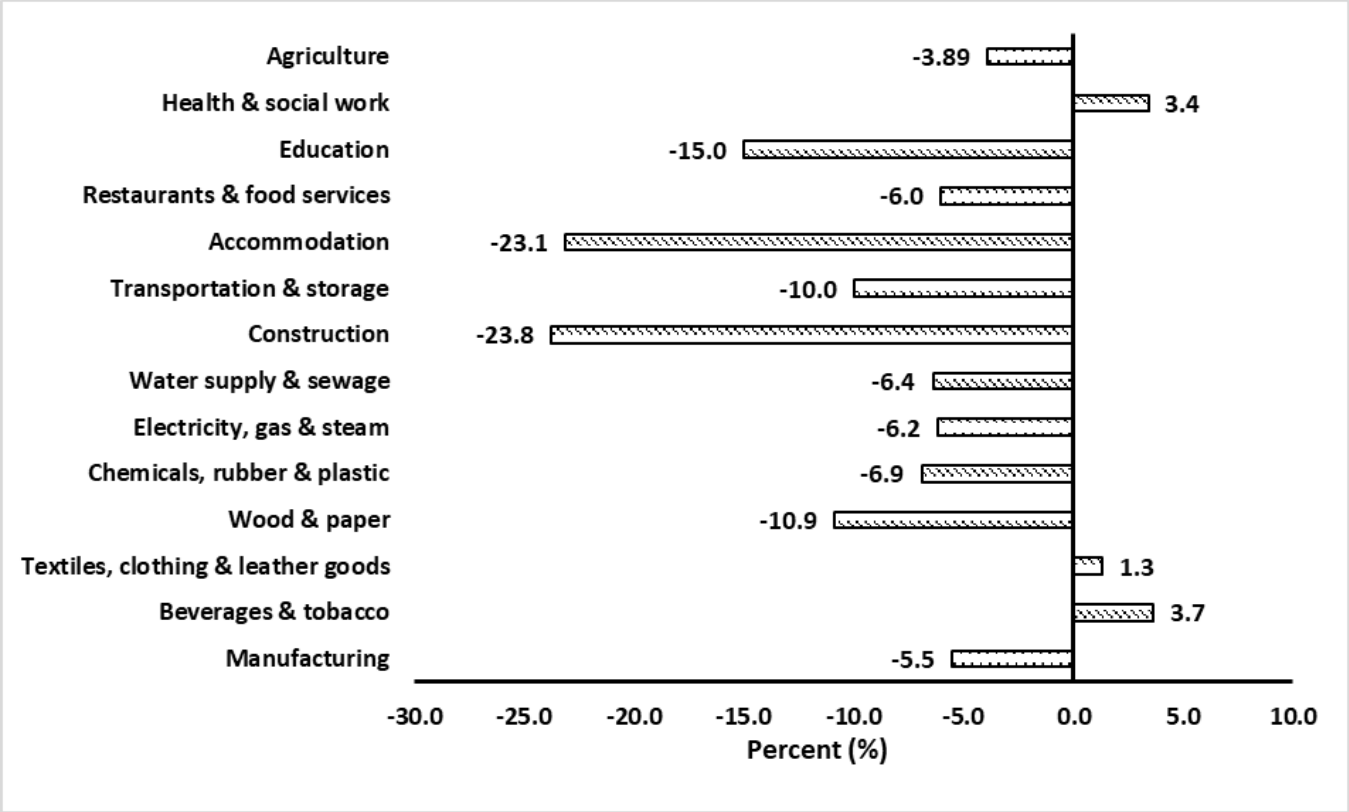


Figure 4 illustrates the effect of the stimulus packages. Sectoral output of the textile, clothing and leather industry increases by 1.3%, as exports began to rise again. Other sectors like manufacturing and education remain on the negative side; however see some improvements. From the tourism industry's perspective, accommodation sub-sector's sectoral output is now -23.1%, which is 11% point increase from the previous simulation. The situation also improves for restaurants and food services (from -18.4% to -6.0%). Similarly, sectoral output also increases for transportation and storage (from -15.6 % to -10.0%) Evidently, stimulus packages distributed to major sectors of the economy brought about improvements in the economy.

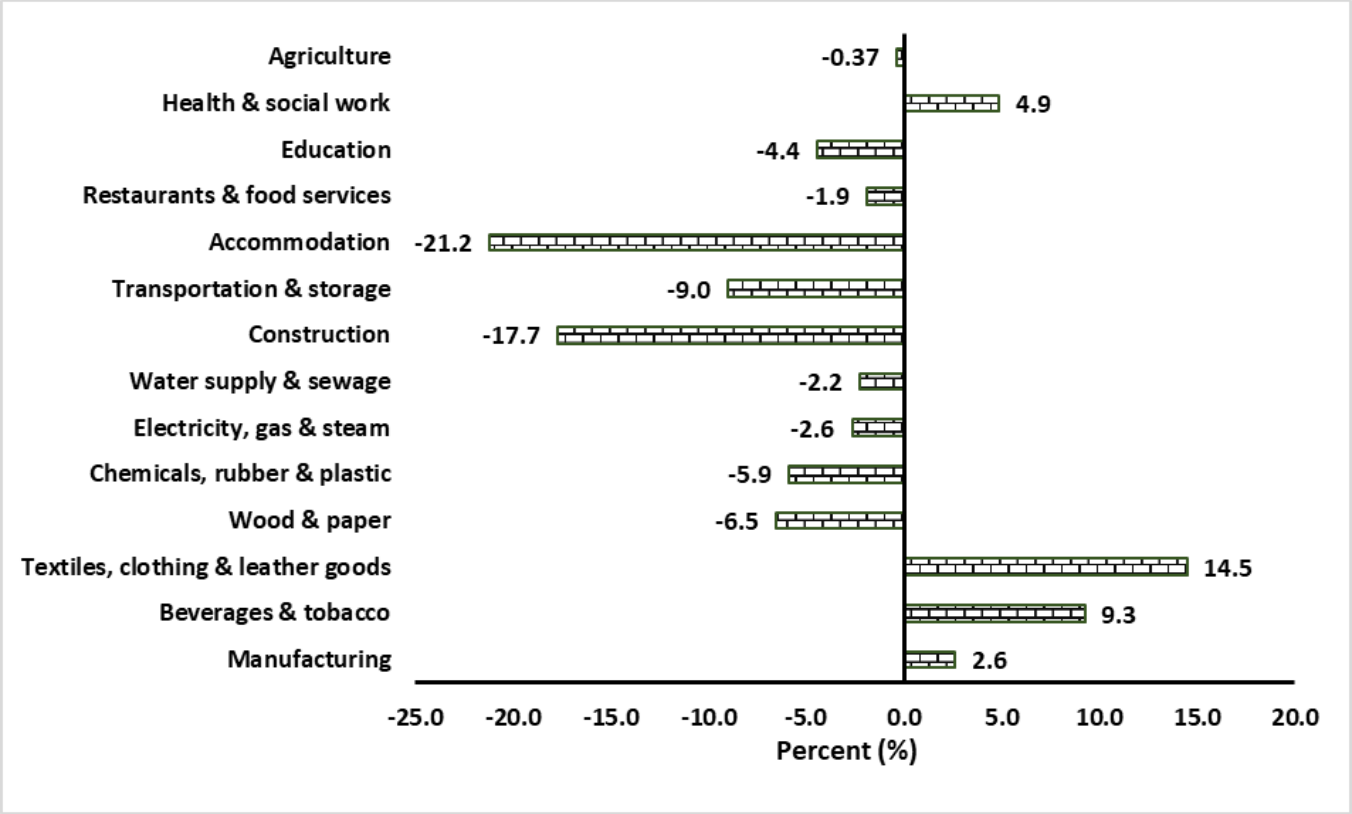
Figure 4. Effects of Covid-19 and Stimulus Packages in Bangladesh



4.1.3 Covid-19, Stimulus Package, and Targeted Government Expenditure in Bangladesh

While it is apparent that stimulus packages improve the economic activity, we intend to find out whether a better outcome can be achieved for the tourism industry and subsequently other industries, had there been slight changes in the distribution pattern of stimulus packages as well as introducing some other explicit government expenditures. The third simulation (SIM3) considers the impact of Covid-19, stimulus packages from the government, and targeted government expenditures (Figure 5). This simulation assumes that the economy still operates at a reduced pace, this time with a 10% reduction in factor availability and moderate reduction in wage rates of different types of labours. A small improvement in the factor availability has been considered to capture the utilisation of the targeted expenditure. The underlying idea is that government increases expenditure through different instruments; firms receiving that allocation then use it for increasing production, and therefore factor demand rises. However, the rate at which demand increases is small to simulate partial lockdown process. Additionally, we assume the government lifts up some financial incentives from slightly non-priority sectors such as electricity, gas, and steam, coal, water oil and minerals during pandemic by 30% and transfer them to the tourism sub-industries with equal weight. Amin et al. (2021) argue that during the Covid-19 period, power sector's allocated amounts can be shifted to other needy sectors to improve sectoral outputs of different industries. There are mainly two reasons: i) the predicted electricity demand has reduced and will be less than actual generation for the next few years (8-10%) and ii) drop in the international oil prices leading to less expenditure for oil import and subsidy. We also consider 10 % increase of the allocated financial assistance for the health and social work industry to improve and maintain health care situation in Bangladesh.

Figure 5. Effects of Targeted Government Expenditures



In this simulation, tourism is targeted specifically for stimulus packages and the results show that sectoral output of transportation and storage goes up from the initial -15.6% in SIM1 to -9.0 in SIM3, followed by accommodation (-34.2% in SIM1 to -21.2 in SIM3), and restaurants and food services (-18.4% in SIM1 to -1.9% in SIM3). In fact, other industries also have a positive impact from the reallocation of the financial incentives, such as the textile, clothing and leather industry, which sees an even larger improvement, going up from the initial -53.3% in SIM1 to 14.5% in SIM3. Overall manufacturing value added improves by 2.6% while education's sectoral output improves significantly. The industries from which the reallocation process was designed are not only unaffected, rather they see an improvement too. For instance, sectoral output of the electricity, gas and steam in SIM3 improves by 14.1 % point and 3.6% point considering SIM1 and SIM2, respectively. Therefore, we conclude that the reallocation process not only helps the tourism industry, but also improve the performance of other industries-a win-win situation, including the ones from which financial incentives has been taken and distributed.

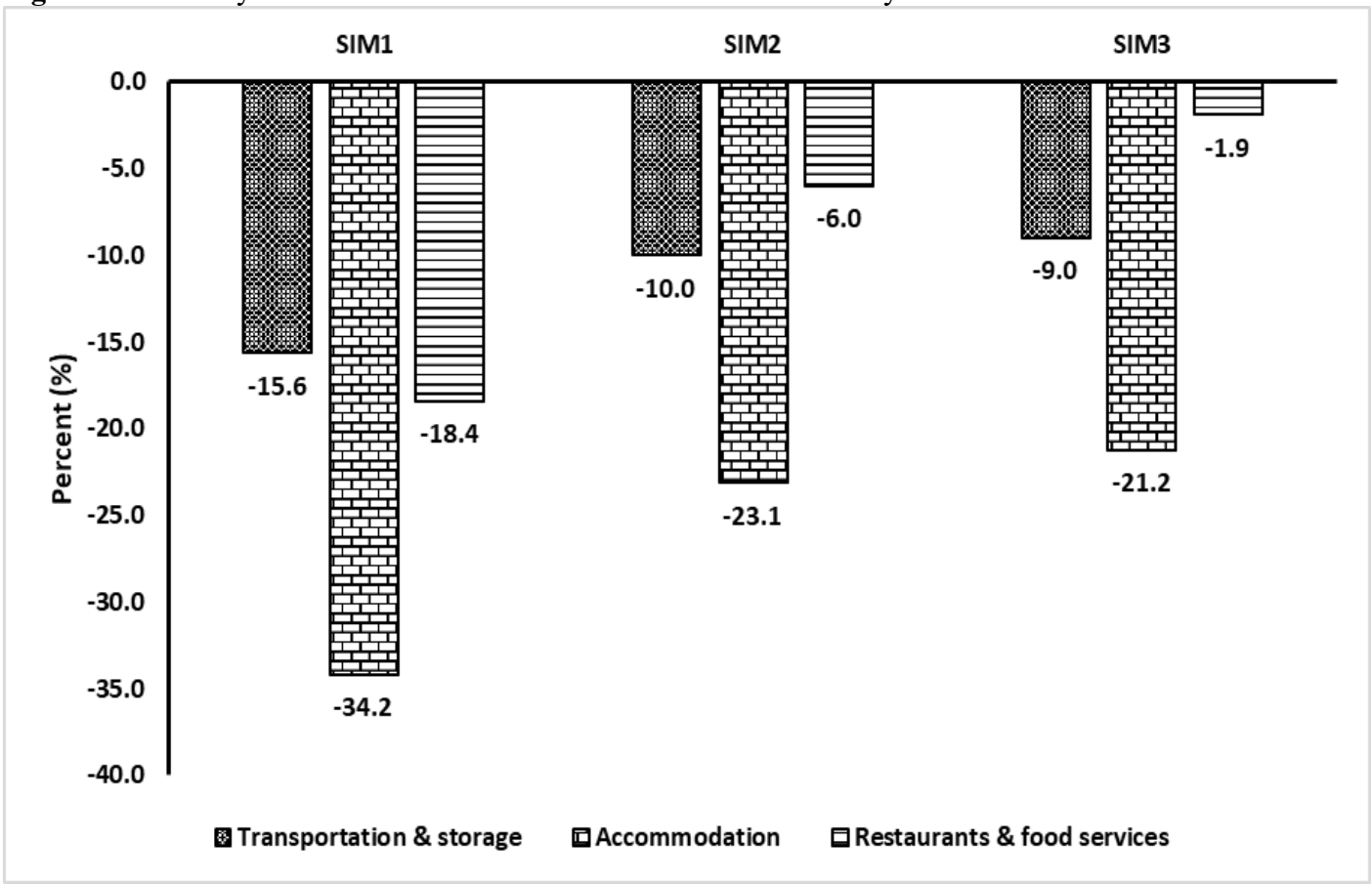
The key reason behind such result is the backward and forward linkages of the tourism industry with other industries in the economy. Backward linkage is a phenomenon in which enhanced production by a downstream industry (tourism) provides positive pecuniary externalities to an upstream industry (other industries like manufacturing, machinery, electricity, etc.) responsible for different stages of the same production process. Forward linkage is the opposite scenario of backward linkage, where improvement in tourism has some positive effect on downstream industries. For example, electricity, gas and steam industry and other mineral industries have backward linkages with the tourism industry. Due to the stimulus packages and targeted government expenditures, the demand and supply side interaction of the tourism industry enhances and becomes more dynamic. This leads to higher sectoral output, and since the process is energy intensive due to the nature of the tourism goods and services, electricity and consumption of other energy commodities increase (Frantál and Urbánková, 2017; Amin et al. 2020; Amin, 2021). Finally, increased energy consumption leads to higher revenue for the electricity, gas and steam industry, reducing the sectoral loss. Another example of

the backward linkage is the relationship between tourism industry and different manufacturing sub-industries. Similarly, from the forward linkage perspective, for example, sectoral output increases in beverages in tobacco industry. It is because as tourism activities revive, demand for goods from the beverages in tobacco industry increases.

4.1.3 Sectoral Output Analysis Summary

Finally, the overall result of the simulation exercises on the tourism's sectoral output can be summarised by **Figure 6**. Without any doubt, it can be seen that stimulus packages and targeted government expenditures improves the sectoral output of the tourism industry even though the values are still negative.

Figure 6. Summary of the Simulation Exercises from Tourism Industry



On the other hand, Table 2 depicts the overall outcome of the three simulations by showing deviation (in %) from the base value. Comparing the speed of recovery, we observe that restaurants and food services recovers from the Covid-19 shock quicker than accommodation and transportation and storage. One of the possible reasons that can explain the slow recovery rate of the accommodation sub-sector is the time-frame considered in our analysis. As Timilsina and Pargal (2020) highlight that CGE simulation results portray an abrupt injection of policy measures in the economy and their outcomes. As a results, some of the change rates may not be fast or similar to others even though activities or commodities belong to same broad category. Naturally, activities from the accommodation sub-sector can take time to recover due to various reasons. Among others, some of the reasons are maintenance time, service standard checks before reopening (especially for high end hotels), customer fee restructuring, etc.

Table 2. Overall Results from the Simulation Exercises

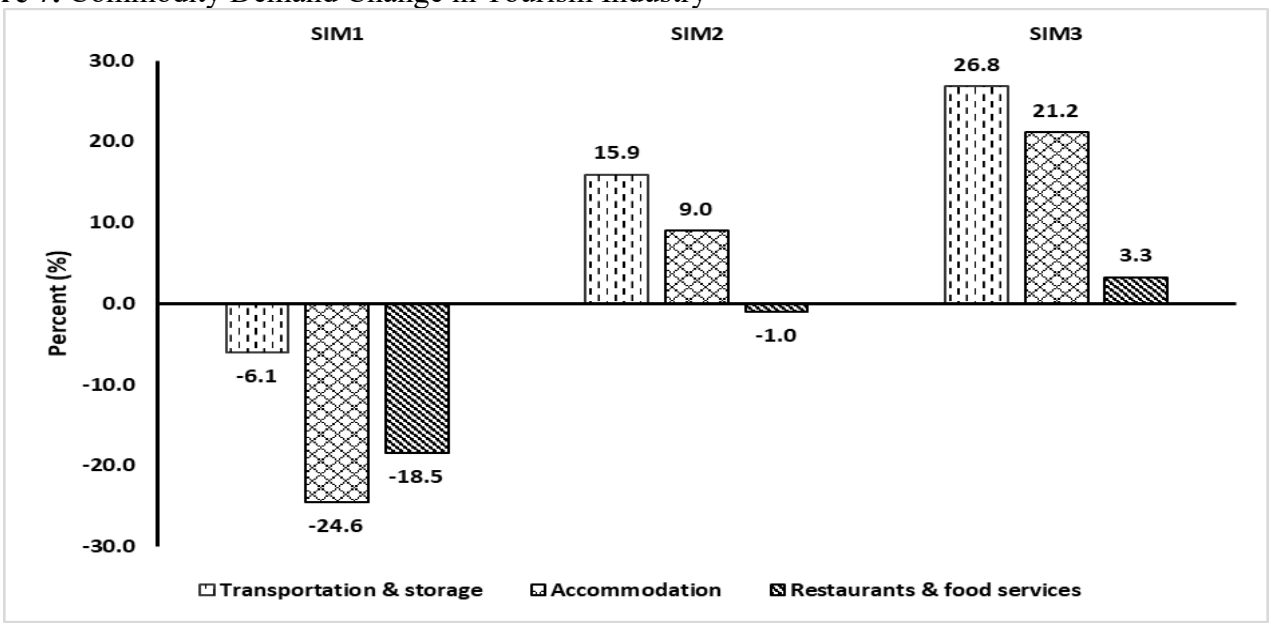
Sectors	Base	SIM1 (%)	SIM2 (%)	SIM3 (%)
Manufacturing	17.1	-35.2	-5.5	2.6
Beverages & tobacco	0.3	-17.0	3.7	9.3
Textiles, clothing & leather goods	8.0	-53.3	1.3	14.5
Wood & paper	0.6	-21.4	-10.9	-6.5
Chemicals, rubber & plastic	0.6	-14.2	-6.9	-5.9
Electricity, gas & steam	1.4	-16.7	-6.2	-2.6
Water supply & sewage	0.02	-18.4	-6.4	-2.2
Construction	7.7	-23.2	-23.8	-17.7
Transportation & storage	9.2	-15.6	-10.0	-9.0
Accommodation	0.2	-34.2	-23.1	-21.2
Restaurants & food services	0.9	-18.4	-6.0	-1.9
Education	2.9	-40.9	-15.0	-4.4
Health & social work	2.2	-8.8	3.4	4.9
Agriculture	16.29	-19.71	-3.89	-0.37

Note: Simulation outputs are percentage change from the base values

4.2 Commodity Demand Analysis

Considering the demand side of the economy, the results show a positive impact on demand as well. The increase in tourism goods and services from the production side translates into higher consumption in the economy. From Figure 7, it is clear that the consumption of tourism related goods and services starts to improve as stimulus packages (SIM2) and targeted government expenditure (SIM3) on tourism industry are being injected. We find that demand for accommodation increases from -24.6% in SIM1 to 9% in SIM2, and then to a 21.2% in SIM3. Transportation and storage increased from -6.1% in SIM1 to 15.9% in SIM2, and finally, 26.7% in SIM3. Furthermore, restaurants and food services saw a rise from -18.5% in SIM1 to -1% SIM2, and lastly to 3.3% in SIM3. So, the simulations with the stimulus packages not only improves the economic activity in tourism but also enhanced demand since consumers and travellers are more confident in tourism and therefore, demanded more of its services.

Figure 7. Commodity Demand Change in Tourism Industry



4.3 Comparison of Overall Macroeconomic Situation

Overall macroeconomic situation after injecting three different shocks can be seen from Table 3. Apparently, the last simulation provides better picture. Without any government stimulus packages, every major macroeconomic components face significant reduction. For instance, investments after SIM1 reduces by 22.84% from the base value and, the situation in SIM3 improves (-19.41%). On the other hand, exports and imports fall by 51.35%, and 23.66% in SIM1, respectively, which raise to 21.14% and 18.38% in SM3 compared to the base value. Similarly we can see that aggregate consumption decreases after Covid-19 shock (-13.39%) in SIM1; however gradually improves in SIM2 (3.67%) and SIM3 (7.73%), respectively. Besides, GDP at both the factor price and market price improve as well. GDP at factor price and market prices reduce by 19.99% and 20.37% from the base value in SIM1. The situation improves as we introduce government stimulus packages (SIM2) as well as targeted government expenditure side by side with stimulus packages (SIM3).

Table 3. Comparison of Macroeconomic Situation

Criteria	Base	SIM1 (%)	SIM2 (%)	SIM3 (%)
Absorption	17.60	-15.41	-4.02	0.34
Consumption	11.35	-13.39	3.67	7.63
Investment	5.22	-22.84	-25.48	-19.41
Exports	3.21	-51.35	8.49	21.14
Imports	3.69	-23.66	7.38	18.38
GDP at market prices	17.11	-20.37	-4.13	0.35
GDP at factor cost	16.25	-19.99	-7.46	-3.19

Note: Simulation outputs are percentage change from the base value

5 Conclusion and Policy Recommendations

The aim of this paper has been to analyses how Covid-19 has impacted the Bangladeshi tourism industry and how the government expenditures can benefit this sector of the economy in the upcoming years. Standard CGE modelling approach has been used in this paper to construct and analyses three simulated scenarios. The first simulation has showed the impact of Covid-19 shock across the industries, the second simulation has showed how the situation improves due of the government stimulus packages, and the third simulation has highlighted how reallocation of the stimulus packages and other government expenditure policies improve the condition of the tourism industry and the economy to an even greater extent (a win-win situation). Such outcome evolves from the multiplier effect due to the enhanced backward and forward linkages that occurs in the economy from the targeted government expenditure policies. When the tourism industry starts to revive domestically, economic agents associated with the industry then spend the money earned for both present and future consumptions, which generate income of the economic agents of the other industries simultaneously, and the process continues, showing the more than proportionate output that is generated because of an input.

To implement the expenditure policies by reallocating sectoral monetary resources, the government needs to work in union and collaborate with major stakeholders in the tourism industry, such as the Bangladesh National Tourism Board (NTO), travel agencies (TOAB), hotel agencies, international development agencies, and other relevant stakeholders. There needs to exist a flawless collaboration between these stakeholders to ensure the sustainability and efficiency of the policy implementation that will bring about a change in the economy. There also needs to be a clear plan on the timeframe of the policy implementation. Since the obtained results are static in nature, we argue that implementation timeframe of the government expenditure policies should be short- and medium-term but with multiple attempts. For long-term policy implementation,

we put emphasis on dynamic CGE models. Furthermore, financial institutions such as banks and Non-Profit Organizations (NOGs), who are responsible for the monetary and financial assets also need to have a dynamic collaboration within themselves so that reallocation of monetary resources can be done without any hindrance.

However, several studies have shown that countries like Bangladesh, India and other South Asian countries have a centralised administrations with various decentralised fragmentations. Since there are too many fragmentation in a centralised government, there is a lack of power for these decentralised agents to work efficiently as the power ability is low and restrictive (Ghafoor et al., 2016; Cai and Aoyama, 2018). It leads to a bureaucratic distortions in implementing policies, and a visible change in the economy is delayed as a result. For example, if the tourism policy-makers want to bring about a change, they might need to get approval of the foreign ministry/state ministry, be redirected to another branch of the system, and so on to get the work done. Also, due to corruption and other administrative related issues, the Small-Medium Enterprises (SMEs) are getting deprived of the benefits from the government stimulus packages and allocated budgetary subsidies. As a result, institutional robustness needs to be strengthen through regulatory legitimacy to reduce the sluggishness of the policy implementation process.

Further research needs to be done to fully understand the economic impact of targeted government subsidies. Possible extensions of this paper include analysing how the adverse impact of Covid-19 on the tourism industry hampers other industries in Bangladesh through different channels, and critically analysing the effectiveness of regional collaboration for sustainable development of South Asian tourism during the post-pandemic period. Another avenue of extension can be to develop dynamic CGE model for analysing long-run policy experiments.

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Appendix

Table A.1. Core Building Blocks of the Model

	Price Block
Price for import	$\boldsymbol{PM_c = pwm_c.(1 - tm_c).EXR + \sum PQ_{c'}.icm_{c'c}}$
Price export	$PE_c = pwe_c.(1 - te_c).EXR - \sum PQ_{c'}.icd_{c'c}$
Non-traded goods price	$PDD_c = PDS_c + \sum PQ_{c'}.icd_{c'}$
Absorption	$PQ_c.(1 - tq_c).QQ_c = PDD_c.QD_c + PM_c.QM_c$
Total output value of the marketed commodities	$PA_c.QX_c = PDS_c.QD_c + PE_c.QE_c$
Price for activities	$PA_a = \sum PXAC_{ac}.\theta_{ac}$
Input price for intermediate activities	$PINTA_a = \sum PQ_c.ica_{ca}$
Cost and revenue for activities	$PA_a.(1 - ta_a).QA_a = PVA_a.QVA_a + PINTA_a.QINTA_a$
Price level	$\overline{CPI}$=$PQ_c cwts_c$
Price level for non-traded commodities	$DPI = \sum PDS_c.dwts_c$
	Production and Trade Block
Production function (CES)	$QA_A = a_a^a.(\delta_a^a.QVA_a^{-\rho_a^a} + (1 - \delta_a^a).QINTA_a^{-\rho_a^a})^{-1/\rho_a^a}$
Ratio: value added and intermediate production	$\frac{QAV_a}{QINTA_a} = (\frac{PINTA_a}{PVA_a}.\frac{\delta_a^a}{\delta_a^a})^{\frac{1}{1+\rho_a^a}}$
Aggregate value added demand (Leontief)	$QAV_a = iva_a.QA_a$
Aggregate input demand (Leontief intermediate)	$QINTA_a = inta_a.QA_a$
Value added (with factors)	$QVA_a = a_a^{va}.(\sum \delta_{fa}^{va}.QF_{fa}^{-\rho_a^{va}})^{-1/\rho_a^{va}}$
Factor demand	$WF_f.\overline{WFDST_{fa}} = PVA_a.(1 - tva_a).QVA_a.(\sum \delta_a^{va}.QF_{fa}^{-\rho a^{va}})^{-1}.\delta_a^{va}.QF_{fa}^{-\rho a^{va}-1}$
Intermediate demand: disaggregated	$QINT_{ca} = ICA_{ca}.QINTA_a$
Allocation for commodities	$QXAC_{ca} + \sum QHA_{ach} = \theta_{ca}.QA_a$
Aggregation for system output	$QX_{ca} = a_c^{ac}(\sum \delta_{ac}^{ac}.QXAC_{ca}^{-\rho_c^{ac}-1})^{-1/\rho_c^{ac}}$
FOC for aggregate output function	$PXAC_{ca} = PX_c.QX_c.(\sum \delta_{ac}^{ac}.QXAC_{ca}^{-\rho_c^{ac}-1})^{-1}.\delta_{ac}^{ac}.QXAC_{ca}^{-\rho_c^{ac}-1}$
CET output transformation	$QX_c = a_c^t[\delta_c^t.QE_c^{\rho t^t} + (1 - \delta_c^t).QD_c^{\rho t^t}]^{1/\rho_c^t}$
Export-domestic supply ratio	$\frac{QE_c}{QD_c} = (\frac{PE_c}{PDS_c}.\frac{1-\delta_c^t}{\delta_c^t})^{1/\rho_c^t}$
Output transformation for non-exported commodities	$QX_c = QD_c + QE_c$
Composite supply function	$QQ_c = a_c^q.[\delta_c^q.QM_c^{-\rho_c^q} + (1 - \delta_c^t).QD_c^{-\rho_c^q}]^{-1/\rho_c^q}$
Import-domestic ratio	$\frac{QM_c}{QD_c} = (\frac{PDD_c}{PM_c}.\frac{\delta_c^q}{1-\delta_c^q})^{1/\rho_c^q}$
Composite supply for non-imported inputs and non-produced imports	$QQ_c = QD_c + QM_c$
Demand for transaction services	$QT_c = \sum(icm_{cc'}.QM_c + ice_{cc'}.QE_c = icd_{cc'}.QD_c)$
	Institutional Block
Factor income	$YF_f = \sum WF_f.\overline{WFDST_{fa}}QF_{fa}$
Institutional factor income	$YIF_{if} = shif_{if}.[(1 - tf_f).YF_f - transfr_{row\,f}.EXR)$
Income of domestic non-gov. institutions	$YF_{if} = \sum YF_{if} + \sum TRII_{ii'} + transfr_{i\,gov}.CPI + transfr_{i\,row}.EXR$
Intra institutional transfer	$TRII_{ii'} = shii_{ii'}.(1 - MPS_{i'}).(1 - TINS_{i'}).YI_{i'}$
Household consumption expenditure	$EH_h = (1 - \sum shii_{ih}).(1 - MPS_h).(1 - TINS_h).YI_h$
Household consumption demand for marketed commodities	$PQ_c.QH_{ch} = PQ_c.\gamma_{ch}^m + \beta_{ch}^m(EH_h - \sum PQ_{c'}.\gamma_{c'h}^m - \sum PXAC_{ac'}.\gamma_{ac'h}^h$
Household consumption demand for home commodities	$PXAC_{ac}.QHA_{ach} = PXAC_{ac}.\gamma_{ach}^h + \beta_{ach}^h(EH_h - EH_h - \sum PQ_{c'}.\gamma_{c'h}^m - \sum PXAC_{ac'}.\gamma_{ac'h}^h)$
Investment demand	$QINV_c = \overline{IADJ}.\overline{qINV}$
Government consumption demand	$QG_c = \overline{GADJ}.\overline{qg_c}$

Government revenue	$YG = \sum TINS_i . YI_i + \sum tf_f . YF_f + \sum tva_a . PVA_a . QVA_a + \sum ta_a . PA_a . QA_a + \sum tm_c . pwm_c . QM_c . EXR + \sum te_c . pwe_c . QE . EXR + \sum tq_c . PQ_c . QQ_c + \sum YIF_{gov\,f} . transfr_{gov\,row} . EXR$
Government expenditure	$EG = \sum PQ_c . QG_c + \sum transfr_{i\,gov} . \overline{CPI}$
System Constraint Block	
Factor market	$\sum QF_{fa} = \overline{QFS_f}$
Composite commodity market	$QQ_{c=} \sum QINT_{ca} + \sum QH_{ch} + QG_c + QINV_c + qdst_c + QT_c$
Balance for current account	$\sum pwm_c . QM_c + \sum trnsfr_{row\,f} = \sum pwe_c . QE_c + \sum trnsfr_{i\,row} + \overline{FSAV}$
Government balance	$YG = EG + GSAV$
Direct institutional tax	$TINS_i = \overline{tins_i} . (1 + \overline{TINSADJ} . tins01_i) + \overline{DTINS} . tins01_i$
Institutional savings rate	$MPS_i = \overline{mps_i} . (1 + \overline{MPSADJ} . mps01_i) + \overline{DMPS} . mps01_i$
Savings-investment balance	$\sum MPS_i . (1 - TNSI_i) . YI_i + GSAV + EXR . \overline{FSAV} = \sum PQ_c . QINV_c + \sum PQ_c . qdst_c$
Total absorption	$TABS = \sum \sum PQ_c . QH_{ch} + \sum \sum \sum PXAC_{ac} . QHA_{ach} + \sum PQ_c . QG_c$
Inv/absorption	$INVSHR . TABS = \sum PQ_c . QINV_c + \sum PQ_c . QG_c$
Gov/absorption	$GOVSHR . TABS = \sum PQ_c . QG_c$

Table A.2. Model Parameters

Parameter	Meaning
a_a^a	CES for activity efficiency
a_a^{va}	CES value added efficiency
a_a^{ac}	Aggregation shift parameter
a_c^q	Armington parameter
a_c^t	CET shifting parameter
β_{ach}^h	Household's additional share for consumption spending
β_{ch}^m	Household's additional share for marketed consumption spending
δ_a^a	CES for activity
δ_{ac}^{ac}	Aggregation for domestic commodity
δ_c^q	Armington parameter
δ_c^t	Share in CET
δ_{fa}^{va}	CES for value added
γ_{ch}^m	Marketed commodity consumption for households (for only *c*)
γ_{ach}^h	Marketed commodity consumption for households(both for *a* and *c*)
θ_{ca}	Output parameter
ρ_a^a	CES production function parameter
ρ_a^{va}	CES value added function exponent
ρ_c^{ac}	Domestic commodity aggregation function exponent
ρ_c^q	Armington function exponent
ρ_c^t	CET function exponent

Table A.3. Model Variables

Variables	Meaning
DMPS	Change in domestic institution savings rates (0 for base; exogenous variable)
DPI	Producer price index for domestically marketed output
EG	Government expenditures
EH_h	Consumption spending for household
EXR	Exchange rate (LCU per unit of FCU)
GOVSHR	Government consumption share in nominal absorption
GSAV	Government savings

INVSHR	Investment share in nominal absorption
MPS_i	Marginal propensity to save for domestic non-government institution (exogenous variable)
PA_a	Activity price (unit gross revenue)
PDD_c	Demand price for commodity produced and sold Domestically
PDS_c	Supply price for commodity produced and sold Domestically
PE_c	Export price (domestic currency)
$PINTA_a$	Aggregate intermediate input price for activity *a*
PM_c	Import price (domestic currency)
PQ_c	Composite commodity price
PVA_a	Value-added price
PX_c	Aggregate producer price for commodity
$PXAC_{ac}$	Producer price of commodity *c* for activity *a*
QA_a	Quantity (level) of activity
QD_c	Quantity sold domestically of domestic output
QE_c	Quantity of exports
QF_{fa}	Quantity demanded of factor *f* from activity *a*
QG_c	Government consumption demand for commodity
QH_{ch}	Quantity consumed of commodity c by household h
QHA_{ach}	Quantity of household home consumption of commodity *c* from activity *a* for household *h*
$QINTA_a$	Quantity of aggregate intermediate input
$QINT_{ac}$	Quantity of commodity c as intermediate input to Activity a
$QINV_c$	Quantity of investment demand for commodity
QM_c	Quantity of imports of commodity
QQ_c	Quantity of goods supplied to domestic market
QT_c	Quantity of commodity demanded as trade input
QVA_a	Quantity of (aggregate) value-added
QX_a	Aggregated marketed quantity of domestic output of Commodity
$QXAC_{ac}$	Quantity of marketed output of commodity *c* from activity *a*
TABS	Total nominal absorption
$TINS_i$	Direct tax rate for institution *i*
$TRII_{ii'}$	Transfers from institution *i'* to *i*
WF_f	Average factor price
YF_f	Income of factor
YG	Government revenue
YI_i	Income of domestic nongovernment institution
YIF_{if}	Income to domestic institution *i* from factor *f*
CPI	Consumer price index
DTINS	Change in domestic institution tax share (0 for base; exogenous variable)
FSAV	Foreign savings (FCU)
GADJ	Government consumption adjustment factor
IADJ	Investment adjustment factor
MPSADJ	Savings rate scaling factor (= 0 for base)
QFS_f	Quantity supplied of factor
TINSADJ	Direct tax scaling factor (= 0 for base; exogenous variable)
$WFDIST_{fa}$	Wage distortion factor for factor *f* in activity *a*