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Managing transitions for sustainable economic development in post-COVID world: do fiscal and monetary support matter?

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ABSTRACT

The COVID-19 pandemic has proved itself to be the most disastrous global phenomenon for economies and societies all across the world. Therefore, keeping this under consideration, this study explores the effectiveness of the fiscal and monetary policies for economic development in the post-COVID period, based on a sample of the BRICS-T countries, over the time period pertaining to 2015Q1-2021Q2. For the empirical investigation, the study has employed the ARDL-PMG approach. The empirical findings of the study have revealed that the fiscal policy effectively contributed towards the economic development in the time duration of the COVID pandemic thus far. However, the COVID-19 pandemic shocks have also resulted in the deterioration of economic development. Our empirical results also put forth critical policy implications. Therefore, in the post-pandemic period, expedient fiscal and monetary policies are requisites in order to achieve sustainable economic development.

1. Introduction

In the last month of the year 2019, a large number of pneumonia cases were reported by the Municipal Health Commission of Wuhan province in China. A novel type of coronavirus was ultimately recognized by the medical professionals who tested and dwelled into the results obtained from some of those who were infected at the time. After that, this virus started to spread not only in China but worldwide. On the fateful day of March 11, 2020, this novel virus had been declared as a pandemic by the World Health Organization, and was given the name Covid-19 (World Health Organization, 2020). Leading on, this unique health catastrophe triggered a devastatingly large number of human deaths. It also shook the confidence of the markets, and stemmed the pace of economic activities, in every corner of the world. The size

and pace of the shrinkage experienced in the economic activities were unprecedented, and have been such that have never been experienced before (Mirza et al., 2020; Yarovaya et al., 2021). It was at this time that the uncertainty experienced in terms of the escalating doubts, and the worldwide economic cessation instigated the closure of the financial markets. The stock markets crashed and fell from their highest index points to the lowest levels, within a one week time span, and this was considered to be the worst collapse of the stock markets since the global financial crisis in the year 2008 (Song & Zhou, 2020). For the first time in history, the oil prices in the US fall below zero dollars, and there was no space to even store the excess supply of crude oil. This was primarily due to the coronavirus shock, and the failure of talks between Saudi Arabia and Russia regarding the restrictions levied on the level of production. As a result, the oil market collapsed, leaving the oil traders reeling, and at the same time, the price of US crude oil fell from US\$18 per barrel, to US\$-38 per barrel. The negative prices were due to the excess supply of oil, and the oil producers fell short of space to store this excess supply. Therefore, they started to pay the buyers against the storage of this excess oil (Song & Zhou, 2020).

According to a report published by the International Monetary Fund (IMF) in 2020, the global economic meltdown caused by the COVID-19 pandemic may have restricted the world economic growth rate to -3, in the year 2020 alone. In such a scenario, on typical terms, the developing markets and evolving economies have to face additional challenges with extraordinary setbacks in the capital streams. This so because the international risk appetite diminishes while handling feebler health arrangements, and more inadequate fiscal ability to offer any assistance in this regard (IMF, 2020). Therefore, in this context, it has become imperative for policymakers and academics to look closely into the factors that can keep the economy's pace going, despite all the pandemic-related hardships and hurdles that arise. It must be noted that the monetary policy is an effective tool in the hands of the central bank of a country through which it can handle the flow of money supply and evaluate the credit situation in the country. In order to achieve different economic goals, the respective central banks can very well make use of the monetary policy instruments effectively. Among the different economic stability objectives that need to be addressed, the monetary policy can help achieve price stability, aid in the correction of a balance of payments problem, stimulate employment opportunities, foster economic growth, and also preserve sustainable development (Falade & Folorunso, 2015). For instance, an easy monetary policy that advocates low-interest rate and increased money supply in the economy, may grease the wheel of the economy. However though, it can also exert inflationary pressures on the economy, which can't be countered or reversed by the high growth rate of the economy (Gertler & Gilchrist, 1994).

Therefore, the success of the monetary strategy in accomplishing its goals is contingent powerfully on the well-functioning economic system, the institutional structure embraced, and the selection of the tools used. On the other hand, fiscal policy is a policy used by the federal government that affects the demand side by raising or lowering taxes or government expenditures. The basic difference between the monetary and fiscal policy is that the central banks control the former while the federal

government operates the latter. However, the macroeconomic objectives of fiscal and monetary policies are the same, i.e., to control the inflationary trend, lower the unemployment rate, reduce poverty, improve equilibrium in the international payments and receipts, and promote economic growth. If the government wants to increase the number of economic activities in the country, it can induce the consumers to spend more by lowering the taxes and raising the government expenditures (Havi & Enu, 2014). Once the government will increase its expenditure, it will open the way for many development projects and create job opportunities. On the other side, lower taxes induce the private people and businesses to enhance their consumption activities, which boosts the level of private investment in the economy and, consequently, the economic activities in the economy. Government can thus practice fiscal strategy to encourage the economy via handling of taxes and outlay (Shah, 1994).

Covid-19 is a worldwide pandemic and the economic conditions of BRICST economies (Brazil, Russia, India, China, South Africa, and Turkey) also get affected drastically due to this phenomenon. These economies adopted several fiscal and monetary policy measures to mitigate the effects of the COVID-19 pandemic. The total budget of 2020 fiscal package is estimated at about 12 percent of GDP in Brazil, 3.5 percent of GDP in Russia, 3.5 percent of GDP in India, 4.7 percent of GDP in China, and 12.7 percent of GDP in Turkey (IMF, 2021). The authorities in BRICST announced several fiscal measures to stabilize the economy such as reimbursement to frontline safety inspectors and medical staff, income support to helpless households, extension in health expenditures, unemployment allowances, cash transfer to low-income and informal workers, bonuses and advance payments to lower-income groups, lower import levies and taxes to medical supplies, fertilizers subsidies for the agriculture sector, expansion in credits of a public bank for households and business, and SMEs, interest rate subsidies for enterprises and SMEs. In response to the COVID-19 pandemic, the central bank in BRICST economies cut the policy rate by 225 bps in Brazil, 200 bps in Russia, 155 bps in India, 50 bps in China, and 300 bps in Turkey (IMF, 2021). BRICST economies adopted certain monetary policy measures including loans to financial organizations sponsored by bonds of private corporations, expansion in capital necessities for small financial organizations, relief to both lenders and borrowers, provision of financial facilities for SMEs, housing finance organizations, and rural banks, discount in liquidity coverage ratio, and expansion in fiscal support to guarantee credit, relaxation in housing policies, and temporary suspension in proceedings of bankruptcy.

By concluding the above discussions, we can say that it is imperative to see the role of fiscal and monetary policy instruments in the resurrection of economic activities in the post-pandemic environment. Consistent with this view, the main objective of this study is to see the impact of fiscal and monetary policies on economic development and their efficacy in the post-covid world. The outcomes of this empirical study are more helpful for policymakers and academicians. The study is beneficial in understanding the COVID-19 pandemic effects on sustainable economic development. This research will help governments of BRICST economies in decision-making regarding economic policies after the incidence of the COVID-19 pandemic. The

study provides implications and directions for monetary and fiscal policies and delivers decision support to appropriate departments to tackle the impacts of the COVID-19 pandemic and boost the sustainability of economic development. Finally, this study also explores potential directions for forthcoming empirical research.

The next section provides a literature review. In section 3, we cover the data and methodology. Results are discussed in section 4 and concluded the study in section 5.

2. Literature review

Economists and academics believe that both monetary and fiscal policies can complement each other in achieving long-term economic growth. However, there is controversy among the proponents of both the policies the monetarists put their weight in favor of monetary policy and consider it more effective in attaining the macroeconomic objectives. In contrast, Keynesian believe that fiscal policy is more efficient in performing its role and achieving targets (Khosravi & Karimi, 2010). Empirics also suggest that effective monetary and fiscal policies can bring stability in the financial sector, maintain the external balance, keep a check on the rising prices and unemployment and finally speed up the process of economic growth and development (Falade & Folorunso, 2015). Nevertheless, several pieces of empirical studies confirmed that monetary policy is superior to fiscal policy in attaining macroeconomic stability and targets, particularly in the developed economies (Anderson, 1986; Elliott, 1975; Senbet, 2011), whereas the parallel results have also been stated for some emerging nations (Amelina, 2012). Conversely, some empirics found the fiscal policy to be more effective in some developed (Artis & Nobay, 1972; Poddar & Hunking, 1971) and emerging nations (Chowdhury et al., 1986; Darrat, 1984; Hussain, 1982) however, some additional researchers have confirmed a substantial harmonizing role for both strategies (Blinder, 1982; Simorangkir & Adamanti, 2010). The previous studies show that there appears to be overall support for monetary strategy in advanced nations, whereas the result on emerging economies is mixed.

Although, numerous literature has reported that the COVID-19 pandemic may cause deterioration to economic development in the short-run. Luo et al. (2020) denoted that the COVID-19 pandemic interrupted the stability of enterprises of China, deteriorated the expectation and operational efficiency of enterprises, declined the growth rates of the incomes of individuals, increased the pressure of employment, and pushed up financial risks and debt. Zhao et al. (2020) revealed that the COVID-19 pandemic has a negative effect on the domestic economy in the short-term phase. Liu (2021) argued that the new waves of the COVID-19 pandemic across the globe accelerated contraction in liquidity of the financial market, assets were sold at lower rates, and resulted in the reduction of prices. Yang et al. (2021) denoted that the COVID-19 pandemic has made sustainable economic development difficult than underneath the financial sector of each economy. Researchers claimed that the COVID-19 pandemic spreads promptly throughout the globe, economies of various regions and countries have contracted and confidence of consumers and investors declined that resulting in having a larger influence on financial markets of the globe as well economic development (Mirza et al., 2020 and Rizvi et al., 2020). Ozili and

Arun (2020) highlighted that constraints in decisions related to monetary policy and foreign tours in order to protect regions and home countries would badly influence the worldwide economy. Moreover, Yu et al. (2021) claimed that due to the COVID-19 pandemic, the shutdown of global production and disruptions of the supply chain could create worldwide ripple impacts in all sectors of the economy in an unprecedented manner. Ramelli and Wagner (2020) highlighted that the deterioration of the health sector due to the COVID-19 pandemic has converted into a worldwide economic crisis. Borio (2020) demonstrated that the financial and economic crisis has caused structural discrepancies in the economy and these discrepancies are completely exogenous and highly uncertain and caused global consequences.

Monetary and fiscal policies are the major regulation tools of an economy and directly affect the sustainability of economic development. It is argued that the COVID-19 pandemic has also influenced the composition of fiscal and monetary policies due to its impact on financial markets and the health sector (Mirza et al., 2020). Rakshit and Basistha (2020) stated that public spending can weaken the magnitude of the economic effect of rare diseases. Liu et al. (2022) demonstrated that the Japanese and United States central banks implemented cross-delivery large-scale policies to protect their economic stability after the unprecedented circumstances of earthquake calamities and terrorist attacks. Ma et al. (2020) showed that a rational combination of monetary and fiscal policies could intensely support economic recovery and efficiently stabilize the financial and economic system in reaction to unanticipated happenings such as the 2003 epidemic of SARS and the 2008 financial crisis. However, several monetary and fiscal policies result in a negative influence on the sustainability of economic development, such as government purchases (Gregory, 2022). So et al. (2021) demonstrated that intervention of fiscal policy could lighten the negative impact of the COVID-19 pandemic, thus confirming sustainable economic development. The previous stock of literature mostly focuses on the effects of epidemic crises on macroeconomic fluctuation, and it is concluded that these crises cause a downturn in economic development. Various researchers have tried to explore the effects of monetary and fiscal policies on the economic conditions under the situation of emergencies, but the research gauging the impact of monetary and fiscal policies on sustainable economic development is still very limited. Moreover, the impact of monetary and fiscal policies on sustainable economic development in the context of the COVID-19 pandemic is still unexplored. Thus, the present study is much needed in order to enhance the stock of literature in the presence of COVID-19 pandemic shock.

3. Model, methods, and data

In this study, our main goal is to see the effects of economic policies and the COVID-19 pandemic on economic performance in BRICS-T economies. To that end, we have augmented the model with the variable of COVID-19 pandemics, and the resulting equation is shown below:

$$GDP_{it} = \beta_0 + \beta_1.COVID19_{it} + \beta_2.GE_{it} + \beta_3.Interest_{it} + et_{it}$$

Arrangement (1) is the economic performance (GDP) function of BRICS-T economies, which depend on the government expenditures (GE), monetary policy-related interest rate (Interest), and COVID-19 pandemic (COVID-19), and randomly distributed error term (ε_{it}). However, this model only provides us with the long-run results. To get the short-run results, we redefine model (1) into error correction specification as specified underneath:

$$\Delta GDP_{it} = \gamma + \sum_{p=1}^{n1} \gamma_{1p} \ \Delta GDP_{it-p} + \sum_{P=0}^{n2} \gamma_{2p} \ \Delta COVID19_{it-p} + \sum_{p=0}^{n3} \gamma_{3p} \ \Delta FP_{it-p}$$

$$+ \sum_{p=0}^{n4} \gamma_{4p} \ \Delta Interest_{it-p} + \pi_1 GDP_{it-1} + \pi_2 COVID19_{it-1} + \pi_3 GE_{it-1}$$

$$+ \pi_4 Interest_{it-1} + \mu_{it}$$

Equation (2) is called panel ARDL-PMG proposed by (Pesaran et al., 1999; Pesaran & Shin, 1995) or panel ARDL-MG proposed by (Pesaran et al., 1999). These techniques have various advantages over other techniques. Firstly, it provides short and long-run estimates with the help of a single equation. However, the validity of long-run estimates is based on the co-integration test, which is error correction modeling (ECM_{t-1}). Secondly, it can take care of the integrating properties of the variables, i.e., it can take the mixture of I(0) and I(1) variables. The family of ARDL modeling provides efficient and consistent estimators because it eliminates endogeneity problems by adding lag length in both explanatory variables. The choice between pooled mean group (PMG) or mean group (MG) estimators is also confirmed through the Hausman test (Pesaran et al., 1999).

For robust analysis, this study is used pooled-OLS (P-OLS), dynamic ordinary least squares (DOLS), and fully modified ordinary least squares (FMOLS) estimators in analysis. The DOLS and FMOLS are highly efficient in handling the issue of serial correlations in the error terms and endogeneity among regressors. The FMOLS is considered one of the non-parametric approaches that control autocorrelation and endogeneity problems (Pedroni, 2001), whereas the DOLS approach eliminates the by adding leads and lags of the explanatory variables (Kao & Chiang, 2001). While DOLS is one of the parametric approaches and gives better results in small samples (Dogan & Seker, 2016). Particularly, the DOLS method can handle cross-sectional dependence (CD) based on the gaining of country-specific coefficients and produce unbiased, efficient, and consistent estimates. (Pedroni, 2004) authors noted that the panel DOLS is less biased than the POLS and FMOLS estimators in small samples. At the same time, the DOLS estimator has better sample properties rather than the POLS and FMOLS estimators. The Dumitrescu and Hurlin (DH) causality test consider heterogeneity and cross dependence, while it produces a robust estimate for small data. Consequently, the next section is also provided the panel estimates and causality test results.

The study's primary objective is to examine the role of fiscal and monetary policy in determining economic development after the COVID-19 pandemic. Quarterly time-series data has been taken from 2015Q1 to 2021Q2 for Brazil, Russia, India, China, South Africa, and Turkey. At the same time, economic development is a

Table 1. Descriptive statistics and panel unit root testing.

| | Descriptive statistics | | LLC | | | ADF | | |
	Mean	S.D	I(0)	I(1)	Decision	I(0)	I(1)	Decision
GDP	15.00	1.672	−3.671***		I(0)	−0.560	−11.36***	I(1)
GE	13.13	1.665	−1.420*		I(0)	−0.378	−15.54***	I(1)
Interest	6.973	4.305	−3.681***		I(0)	−2.628*		I(0)
COVID-cases	3.084	2.549	−0.388	−1.826**	I(1)	−0.220	−5.032***	I(1)
COVID-deaths	2.101	2.261	−0.471	−3.572***	I(1)	−0.348	−7.031***	I(1)

Note: ***$p < 0.01$; **$p < 0.05$; and *$p < 0.1$.
Source: Author's Estimation.

dependent variable that is measured as GDP per capita. Response of fiscal policy is measured through government expenditure as a percent of GDP. The interest rate in percent per annum is used to measure the response of monetary policy. COVID-19 confirmed cases and COVID-19 death cases are representative variables for the COVID-19 pandemic. Data on fiscal and monetary policy variables are taken from International Monetary Funds, and the data on COVID-19 variables are extracted from "Our World in Data." Data on COVID-19 reported, and death cases and economic development variables are used in natural logarithmic form. Table 1 reports descriptive statistics. The mean of GDP, GE, interest, COVID-cases, and COVID-deaths are 15.00 US$, 13.13 million, 6.973%, 3.084, and 2.101, respectively, while the standard deviation are 1.672 US $, 1.665 million, 4.305%, 2.549, 2.261, respectively.

4. Results and discussion

To investigate the monetary and fiscal policy effectiveness in the economic development in the post-COVID-19 time, we employed panel ARDL-PMG, P-OLS, FM-OLS, and D-OLS. The ARDL-PMG is the baseline model, whereas other techniques are applied to check the robustness of our estimates. The first step in this regard is to check the stationarity of the variables to confirm that none of the variables in the model is I(2) because we can't include any such variable in the model. We have performed three-unit root tests in this context, i.e., Levin, Lin, and Chin (LLC) and ADF-Fisher. The results of these tests confirm in Table 1 that our variables are either I(0) or I(1). Hence, we can proceed with the application of panel ARDL-PMG.

Table 2 demonstrates the estimates of panel ARDL-PMG, whereas the results of P-OLS, FM-OLS, D-OLS are represented in Table 3. First, we discuss the estimates of the ARDL-PMG model, where we estimate three models. The first one only focuses on the fiscal policy, the second focuses on the monetary policy, and the last includes both the fiscal and monetary policy variables and the COVID-19 variables. After discussing the results of Panel-ARDL PMG, we shift our focus to the estimates of the other three methods provided in Table 3.

From Table 2, we collect that the estimates attached to ECM(-1) are significantly negative imply that the variables GDP, GE, Interest, COVID-Case, and COVID-Death are cointegrated i.e., they have a valid long-run relationship among them. As the long-run estimates are cointegrated, therefore we can discuss the long-run results. Hausman test supported the PMG estimator in Table 2. The estimate attached to GE is positively significant in model 1, suggesting that a 1% rise in GE causes the GDP

Table 2. COVID-pandemic and economic development (ARDL-PMG).

	ARDL-PMG					
	(1)		(2)		(3)	
Variable	Coefficient	t-Stat	Coefficient	t-Stat	Coefficient	t-Stat
Long-run						
GE	0.937***	52.54			0.946***	5.924
Interest			−0.061	0.623	−0.004	1.034
COVID-case	−0.069***	3.735	−0.035	0.807	−0.066***	3.680
COVID-Death	−0.104***	3.949	−0.422***	6.991	−0.097***	3.759
Short-run						
D(GE)	−0.010	−0.135			−0.030	−0.392
D(Interest)			0.085	1.384	0.003	0.442
D(COVID-case)	−0.017	1.383	−0.070**	−2.359	−0.016	1.340
D(COVID-death)	−0.038**	−2.208	0.207	0.974	−0.035**	−2.324
C	1.197**	2.298	−2.156	−0.817	1.193**	2.366
Diagnostics						
Log likelihood	220.6		171.3		221.4	
ECM (-1)	−0.423**	−2.307	0.170	0.859	−0.437***	−2.362
Hausman test	4.212		3.688		5.654	

Note: ***p < 0.01; **p < 0.05; and *p < 0.1.
Source: Author's Estimation.

Table 3. COVID-pandemic and economic development (P-OLS, FM-OLS, and D-OLS).

	FE-OLS		FM-OLS		D-OLS	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
GE	0.721***	15.51	0.522***	27.21	0.912***	9.931
Interest	−0.001	0.511	−0.012***	7.331	−0.024***	11.63
COVID-case	−0.001	0.011	−0.013***	6.761	−0.011***	19.14
COVID-death	−0.003	0.061	−0.022***	6.581	−0.012***	5.366
Cons	5.520***	9.161	3.211	12.65	4.022***	13.02

Note: ***p < 0.01; **p < 0.05; and *p < 0.1.
Source: Author's Estimation.

to rise by 0.937%. Conversely, the estimates attached to COVID-case and COVID-Death are significantly negative, implying that a 1% rise in the COVID-related cases and deaths causes the GDP to decline by 0.069% and 0.104%, respectively. This finding is also consistent with Liu (2021), who noted that China's economy is also significantly affected via COVID-pandemic. This finding is also supported by the study on developing economies (Alon et al., 2020), which noted that COVID-19 is forming worldwide uncertainty and enormous social and economic impacts.

In model 2, the estimated coefficient of only one variable i.e., COVID-Death, is negatively significant while all other variables are insignificant. This result implies that a 1% rise in deaths due to COVID-19 causes the GDP to decline by 0.422%. In the third model, in which we have included all four variables, the estimated coefficient of GE is positively significant, and the estimate attached to Interest is negative but insignificant. On the other side, estimates attached to COVID-case and COVID-Death are negatively significant. Numerically, a 1% rise in GE causes the GDP to increase by 0.946%, whereas a 1% rise in the COVID cases and deaths causes the GDP to reduce by 0.066% and 0.097%, respectively. Table 2 also provides the short-run estimates, and most of them are insignificant except the estimates of D(CVOID-Death), which are negatively significant in the first and third models, and the estimate of D(COVID-case) is negatively significant.

From Table 3, we gather that the estimates attached to GE are positively significant with P-OLS, FM-OLS, and D-OLS techniques. The estimated coefficients are 0.721%, 0.522%, and 0.912%. Conversely, the estimated coefficients of Interest is insignificant in the P-OLS model and negatively significant in the FM-OLS and D-OLS models. These findings imply that a 1% increase in the interest rate hurts the economy's growth by 0.012% and 0.024% in the FM-OLS and the D-OLS models, respectively. Next, the estimates attached to COVID-case and COVID-Death are significantly negative in the FM-OLS and D-OLS models. The outcomes show that BRICS-T's economies are also significantly affected. In numerical terms, we can say that a 1% rise in the COVID related cases causes the GDP to decline by 0.013% in the FM-OLS and 0.011% in the D-OLS, and a 1% rise in the COVID related deaths causes the GDP to decline by 0.022% and 0.012% in the FM-OLS and D-OLS respectively.

These findings are also consistent with Padhan and Prabheesh (2021), who infers that monetary and fiscal policies mitigate the adverse economic effects of COVID-19. Our finding is also supported by Liu et al. (2020), who found that economic policies have brought more positive effects on the economy via the finance market in the globe. Our robust finding is in line with Wei and Han (2021), who infers that unconventional monetary policies are more effective for economic recovery during the COVID- pandemic. These findings have proven the superiority of fiscal policy over monetary policy in affecting economic development during and after the COVID-19 period because not only the estimates of GE appeared to be significant in most of the models, but the size of these estimates are large in size as compared to the estimates attached to the Interest. However, both monetary and fiscal policies complement each other in achieving the economy's main goals, particularly in a situation like a pandemic where an external shock has seriously disturbed most economies' stability and balance. However, the advocates of both policies have a controversial view on the efficacy of these policies in attaining economic objectives and tackling any internal or external shock. The Keynesians believe that fiscal policy is more effective, while the monetarists believe in the superiority of monetary policy (Khosravi & Karimi, 2010). Our findings suggest that raising government expenditures, a fiscal policy tool, can help promote the GDP. Whereas the interest rate, a tool of monetary policy, does not significantly affect the GDP. These results are not surprising because when all the economic activities were closed during the lockdown, changing the interest rate would not affect any business and economic activities.

Moreover, even during the recovery period, frequent interest rate changes may disturb economic growth due to uncertainty attached to such changes. On the other side, many governments have transferred unemployment and poverty benefits to the middle and lower-income classes of the society, which lifted their living standards during the shutdown period. Many businesses and firms also require bailout packages after the lockdown period to restart their ventures, which will boost government expenditures and, consequently, economic growth. Moreover, after the lockdown and during the recovery period, the government needs to inject money into the various sectors of the economy to speed up the process of economic growth. Many others also support the superiority of fiscal policy over its counterpart (Faria-e-Castro, 2021; Hussain, 1982; Makin & Layton, 2021; Munongo, 2012).

Table 4. Panel causality test.

Null Hypothesis:	W-Stat.	Zbar-Stat.	Prob.	Decision
GE →GDP	4.541	2.008	0.045	Yes
GDP →GE	12.50	8.984	0.000	Yes
INTEREST →GDP	6.250	3.505	0.001	Yes
GDP →INTEREST	6.441	3.673	0.000	Yes
COVID-case →GDP	1.476	−0.679	0.497	No
GDP →COVID-case	2.668	0.366	0.714	No
COVID-death →GDP	2.819	0.498	0.618	No
GDP →COVID-death	5.714	3.036	0.002	Yes
INTEREST →GE	7.623	4.707	0.000	Yes
GE →INTEREST	4.777	2.214	0.027	Yes
COVID-case →GE	2.243	−0.006	0.995	Yes
GE →COVID-case	5.248	2.628	0.009	Yes
COVID-death →GE	1.575	−0.592	0.554	No
GE →COVID-death	5.824	3.132	0.002	Yes
COVID-case →INTEREST	3.848	1.401	0.161	No
INTEREST→COVID-case	3.101	0.746	0.456	No
COVID-death →INTEREST	12.28	8.799	0.000	Yes
INTEREST→COVID-death	9.344	6.218	0.000	Yes
COVID-death→COVID-case	33.54	7.432	0.000	Yes
COVID-case→COVID-death	13.44	8.727	0.000	Yes

Note: ***$p < 0.01$; **$p < 0.05$; and *$p < 0.1$.
Source: Author's Estimation.

Finally, the results of panel causality tests are reported in Table 4. According to causality results, we find bi-directional causality between GE ↔GDP, Interest↔GDP, COVID-case↔GE, and COVID-Death↔Interest. However, we find support for uni-directional causality in the rest of the cases.

5. Conclusion and policy recommendations

Along with human costs of health disasters, the lockdown of COVID-19 led to world-wide business closure, livelihood losses, increased hunger, and poverty. To combat this pandemic, the governments adopted precautionary measures such as curfews and shut-downs that created significant challenges for economies' social and economic progress. In order to overcome this situation, there is a dire need to adopt such policy measures that leads to economic development. This paper moves towards this direction. This paper explores the effectiveness of fiscal and monetary policy in maintaining economic development during the COVID-19 pandemic in Brazil, Russia, India, China, South Africa, and Turkey. For empirical investigation, the study employed the ARDL-PMG approach on quarterly time-series data ranging from 2015Q1 to 2021Q2.

Our findings reveal that fiscal policy positively contributes to economic develop-ment in BRICS-T economies, as an increase in government expenditures leads to positive change in economic development in the long run. However, monetary policy has no significant impact on economic development in the long run in a pandemic, as the findings reveal that the coefficient estimate of interest rate is statistically insig-nificant. The COVID-19 pandemic deteriorates the economic condition badly due to an increase in the number of new cases and death cases, and economic development decreases in the long run. The fiscal and monetary policies have no effective role in economic development in the short run during a pandemic. The impact of the COVID-19 pandemic is negative on economic development in the short run.

The results also provide some valuable inference on the post-COVID recovery. The direct and indirect impacts are large in BRICS-T economies, and policy and monetary-based policies stand out in this respect. Monetary and fiscal policies should be coordinated closely during the COVID-pandemic. Governments should normalize COVID-pandemic via monetary and fiscal policy. Government sets the rules and regulations that underpin the post-COVID recovery. Resources for COVID-19 treatment must be boosted by improving economic development. Governments need to provide exceptional support to consumers and producers by maintaining the equilibrium in the market. Consequently, BRICS-T authorities' monetary and fiscal policies should primarily focus on supporting agricultural, industrial, and service sectors. Therefore, coordination among fiscal and monetary policies should be dominant. The most effective responses may be a mixture of twin policies that relax the problem of weak growth.

While current monetary and fiscal policy policies are appropriately focused on stimulating supply and demand and supporting employment, existing challenges such as weak economic growth are likely to remain applicable post-pandemic. The COVID-19 has become severe shocks to the globe including societies and economies. A mixture of supply-side and demand-side measures may prove to be more effective to increase the recovery after the COVID-pandemic. Supply-side structural reform is also more important for the post-COVID economic recovery in BRICS-T. Also, BRICST's authorities' expansionary fiscal and monetary policy is mainly in the form of targeting each sector of the economy.

This research is also a burning issue for developed, developing, and emerging countries, which is missing in the analysis. Economists should draw more upon research from other areas for sustainable development. More research on government and economics is important for post-COVID recovery. Future empirical studies can conduct a comparative analysis on twin policy responses for the post-COVID economic recovery around the world. Future research should also focus on the impacts of the COVID-pandemic on exchange rates, capital flows, and various sectors of the economy. Furthermore, there is a countless choice for future research to scrutinize how the developed, developing, and emerging countries function in the pandemic situation and adopt policies to overcome economic issues.

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